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FEBRUARY 16, 1957
VOL. 152—NO. 7

# Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

**FIRE EMERGENCY**

**This switchboard, released from service by a cut-over to automatic at St. Helena, Cal., was quickly hustled aboard a truck to replace another exchange which was destroyed by fire. It was moved complete with cables and distributing frame. See page 30.**

Guaranteed Circulation This Issue
11,671 of Which 11,107 Is Paid

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

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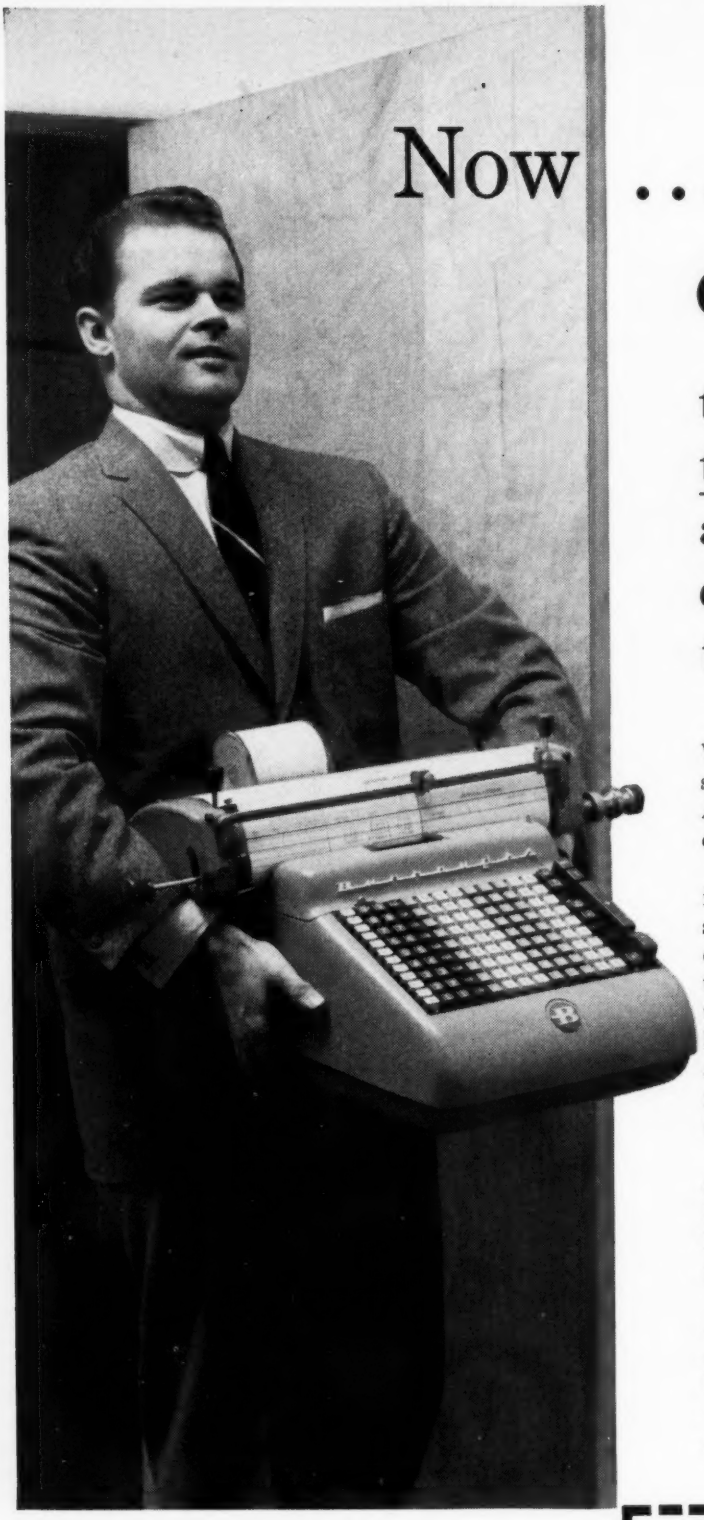

# Now ...open your doors, too...

## to the simplest, the thriftiest revenue accounting plan ever devised for independent telephone companies

Whether your company serves only a hundred subscribers or up to 1,000, the Burroughs Director Accounting Plan is the sensible, *low-cost* and complete answer to revenue accounting.

The Burroughs Director Accounting Machine is engineered to mechanize, and *simplify*, toll statement totaling, stub or ledger plan billing, collection report preparation, establishing control totals by types of service—yes, all on one and the same machine! It is incomparably faster than hand billing. It is as easy as A B C for any operator to put the system to work for you. The new accuracy and neatness of your bills will help build subscriber confidence and good will.

Wide or narrow forms, tape or combinations are handled with ease by this flexible machine. In fact, from *every* standpoint the low-cost Burroughs Director is exactly *right* for the independent telephone company.

Your choice of two thrifty models—the Burroughs Director 400, or the 600. For more complete information on these, and on the Burroughs Director Revenue Accounting Plan, fill out and send in coupon.

"Burroughs" is a trademark

*Wherever there's business there's*

Burroughs B

**Burroughs Corporation**

DETROIT 32, MICHIGAN

Gentlemen: Please send me, without obligation, your booklet, "Low-Cost Revenue Accounting for Independent Telephone Companies."

NAME _____ TITLE _____

COMPANY _____

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CITY _____ ZONE ____ STATE _____

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# New components in D-Series Dial make operation smoother and easier for your subscribers

You will enjoy greater subscriber good will—with the improved Stromberg-Carlson D-Series Dial.

Smoother and easier operation has been accomplished with these improved components:

1. Back bearing and cam combination, now made of nylon.
2. Bridge is mounted in a way that makes removal easy.

*Increased subscriber good will* because these new components provide smoother operation:

1. Impulse cam spring conforms to shape of bridge bearing, reducing friction.
2. In addition to maintenance economy, you enjoy increased inventory saving. That's because a C-Series Dial could be rebuilt with D-Series parts and subassemblies.

*Call or write your Stromberg-Carlson representative for complete technical data and price information.*

S-C STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

GD GENERAL DYNAMICS

# FLASHES AND PLUGS

**IN A WHIRL ALL HIS OWN.** A young Air Force navigator, stationed somewhere in the South Pacific, was flying near Australia, carrying out exercises in navigation and discovering his geographical position with a sextant.

After a series of involved and confused calculations, he turned suddenly to his pilot and said "Take off your hat."

"Why?" asked the pilot.

"Because, according to my calculations, we are now inside St. Paul's Cathedral."

•

**COMFORTS OF HOME.** A man called Des Moines, Ia., police on Jan. 23 from the Union Bus depot. "Do you take in lodgers at the jail?" he asked.

Police customarily allow transients and others down on their luck to spend a night in the jail if they have no funds to rent a room.

"Yes, we can let you stay here for the night," the police dispatcher answered.

"Fine, then send one of your cars over and pick me up, please," came the reply. "I've got baggage and I can't carry it that far."

The man later arrived at the police station on foot.

•

**GROWLER.** A telephone operator in Beloit, Wis., thought she was getting a complaint on service Jan. 31 when she said, "Number please," and got nothing but growls, reports the United Press.

Line repairmen discovered the trouble. Somebody's dog had tipped the receiver off the cradle and was growling into the mouthpiece.

•

**SHARE AND SHARE ALIKE.** From the Okanogan (Wash.) *Independent* comes a report that the members of the Tunk Valley Telephone Association voting in the Grange Hall at the annual meeting decided to dissolve the company.

It was also stipulated that each share owner is to roll up a mile of wire.

(The *Independent* added that the valley won't be without telephone service because Pacific Telephone & Telegraph Co. has built a new line to subscribers in the Synarep area.)

•

**HOLD EVERYTHING.** An Italian soccer fan is asking a court to stop the scrapping of 178,499 old telephone books, reports the Associated Press. He left a football pool ticket worth $3,300 in his 1956 directory, and the telephone company picked the book up while he was out.

•


**CIRCULATION**

Guaranteed circulation of this issue is 11,671, of which 11,107 is paid.



Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
*Since 1901*

**February 16, 1957**


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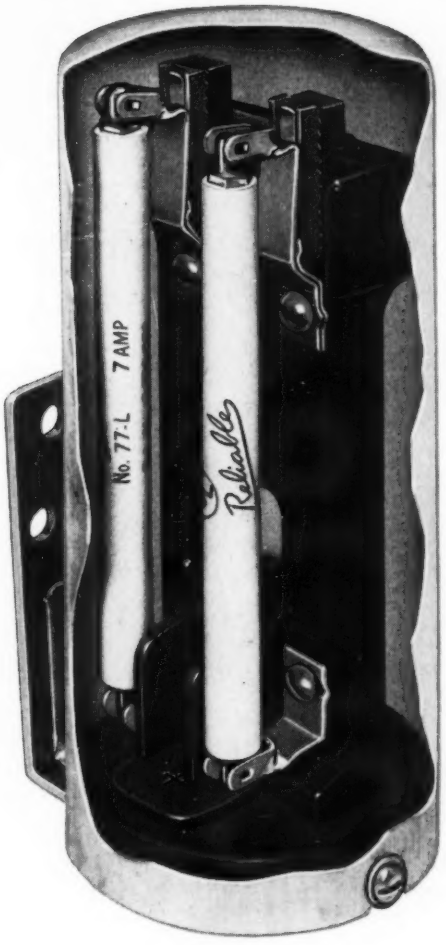
Telephone WA bash 2-2435




The flexible neoprene base has integral wire entrance sealing slots and, with its tapered design, closes the cover so snugly that it is truly weathertight and insect tight.

## Station Protection–A New Design

Only the fuses and the discharge blocks remain unchanged–performance and dependability continues as before. There is a phenolic fuse mount, rather than porcelain–a flexible neoprene base with integral wire entrance sealing slots instead of open wire holes–a fuse mount and terminal post redesign that puts the wiring snugly in place without removing fuses–a fuse mount that can be easily reversed to wire from right or left. All metal parts are either bronze, aluminum or stainless steel.

Reliable's new Series 2000 Station Protector replaces the Series 1000 with design changes only–changes that are good for the Telephone Plant.

Reliable

RELIABLE ELECTRIC COMPANY CHICAGO

if you want dial . . .

it's **KELLOGG** for

# THE MOST COMPLETE L

## CROSSBAR

Crossbar switching allows you maximum expansion . . . requires practically no routine maintenance . . . gives you high traffic capacity . . . has convenient drawer mounted switches which are easily accessible . . . allows PBX grouping service . . . is adaptable to inter-toll dialing.

## STEP-BY-STEP

Step - by - Step switching gives you long life and low cost operation . . . is expandable for increased station and traffic requirements, allows trunking flexibility . . . is easy to check and adjust (each switch is a separate unit) . . . is compact and space-saving.

## RELAYMATIC

Relaymatic all-relay switching is simple to install and easy to maintain . . . . operates with any type of trunk line . . . allows you up to 10 party selective divided ringing . . . has adaptors available for grounded rural lines.

# TE LINE IN THE WORLD !

## 7-A2 ROTARY

Rotary switching gives you the advantages of motor driven, register-type system . . . allows large trunk groups and is adaptable to inter-toll dialing.

## PABX'S

For PABX's you have your choice of several types of switching: cross-bar . . . step-by-step . . . or relaymatic . . . in all sizes.

Your Kellogg representative is well qualified to help you choose the dial system that best fits your needs . . . only Kellogg offers a complete line of dial equipment to the independent telephone company.

For more detailed information on any of these systems ask your Kellogg representative.

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A DIVISION OF I T & T

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*A Division of International Telephone and Telegraph Corporation*
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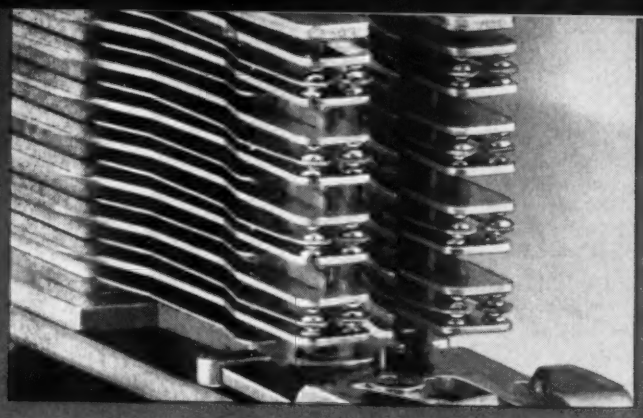
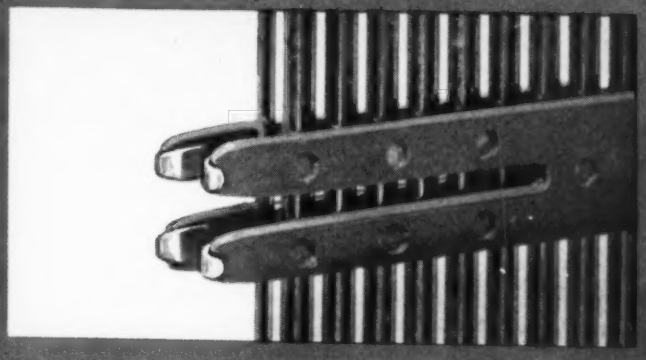
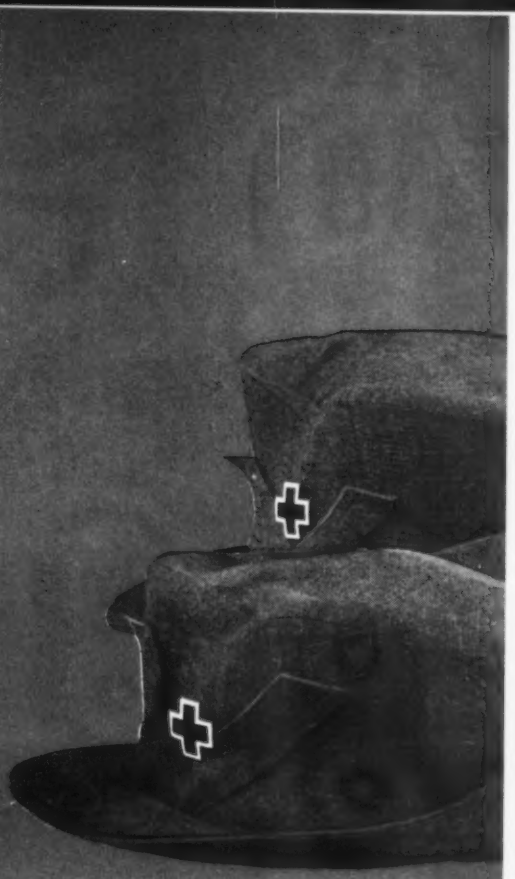
TWIN C



Twin contacts provide positive insurance of reliable operation and long life in relays (above) and switch wipers (below)





# CONTACTS

Two pilots in the cabin of an airliner . . . a second man in a cross-country truck . . . a fireman to spell a Diesel engineer—any operation is more reliable when *two* men are in control. And the same "insurance" applies to the transmission of telephone conversations.

That's one reason why Stromberg-Carlson has standardized on TWIN contacts throughout its XY® Dial System—on switch wipers and relay springs. Laboratory tests have proved twin contacts to be over 22 times as reliable as singles.

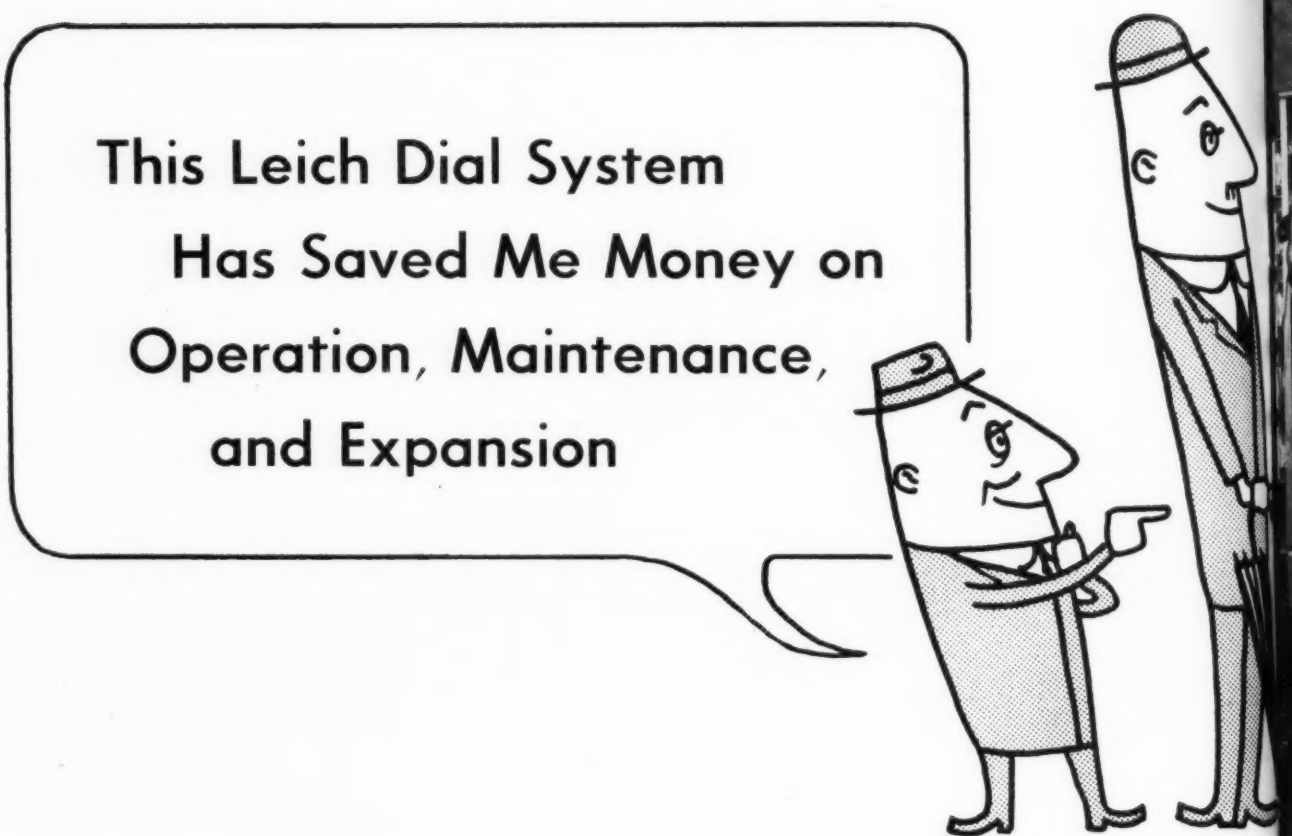
XY Dial Systems are the *only* step-by-step system with this feature of reliability and service economy.

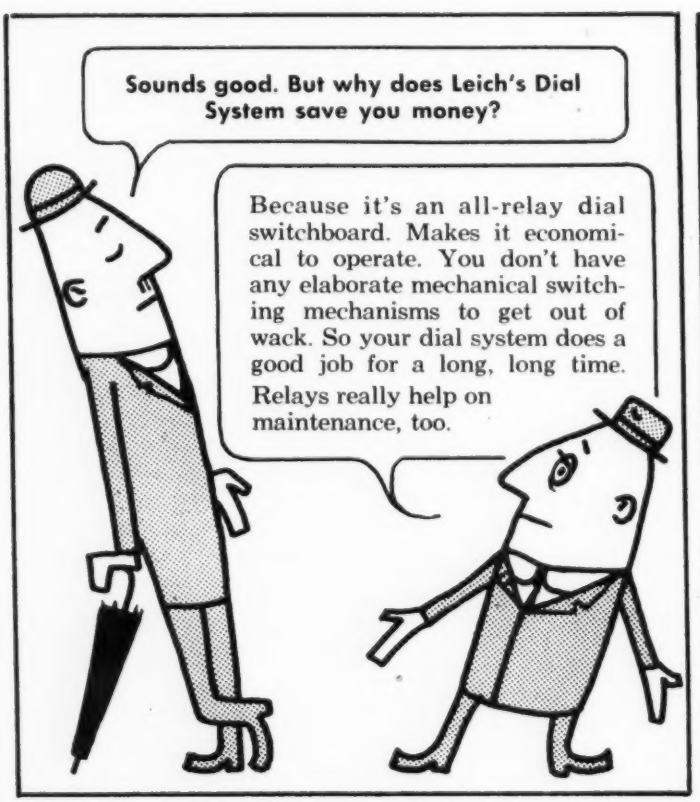
Add other XY Dial System advantages—dust-free vertical wire banks; universal use of the XY step-by-step switch as finder, selector or connector; space-saving "double-sided" placement of switches and circuit plates—and you'll begin to see why independent companies have made XY Dial Systems America's Number One choice.

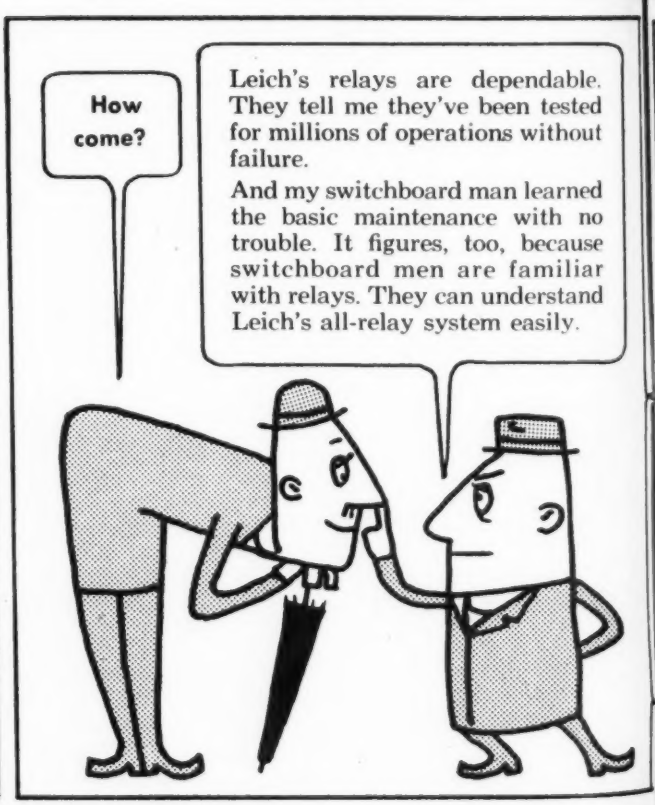
**STROMBERG-CARLSON COMPANY**

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 9, Chicago 6, Kansas City 5, Rochester 3, San Francisco

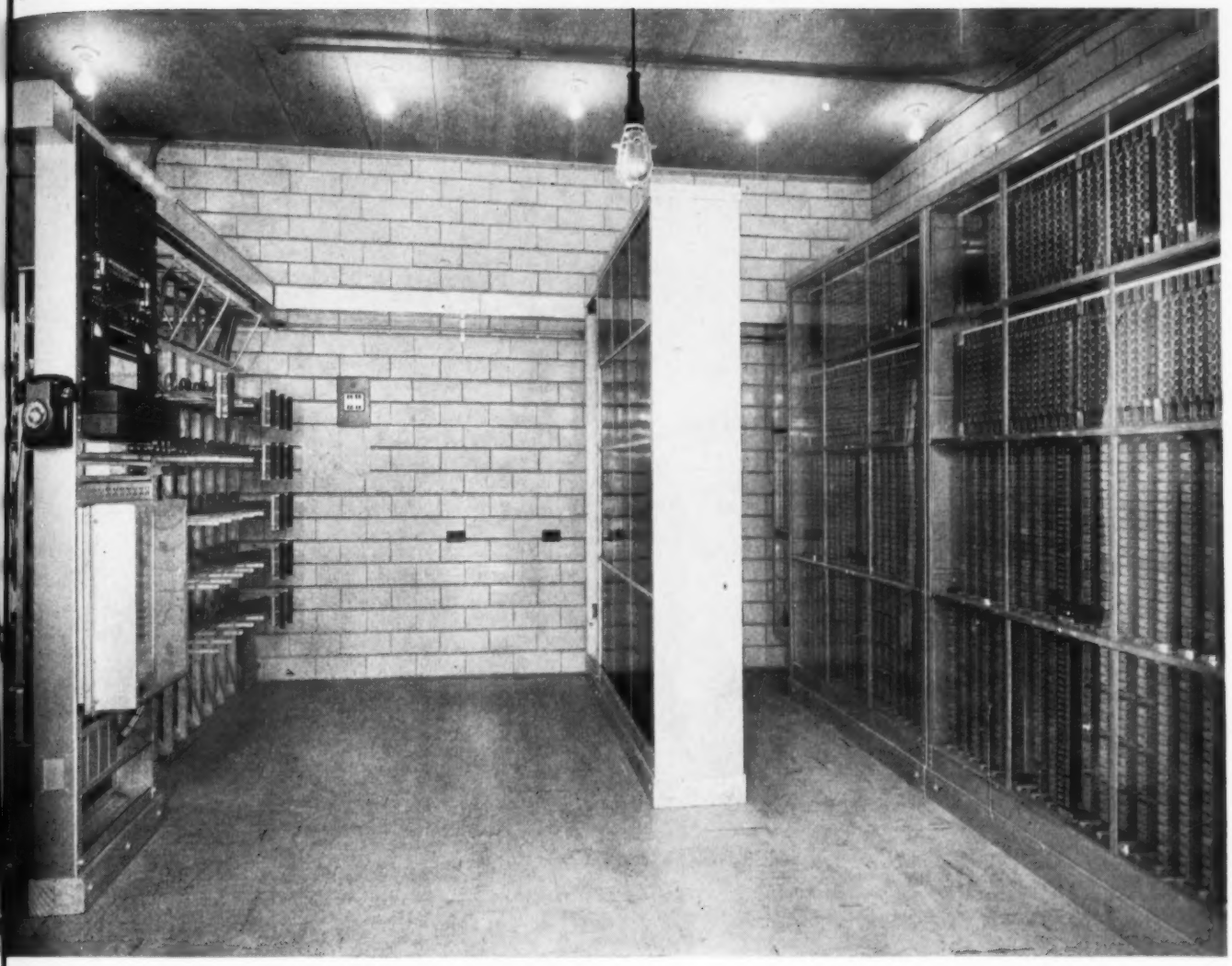


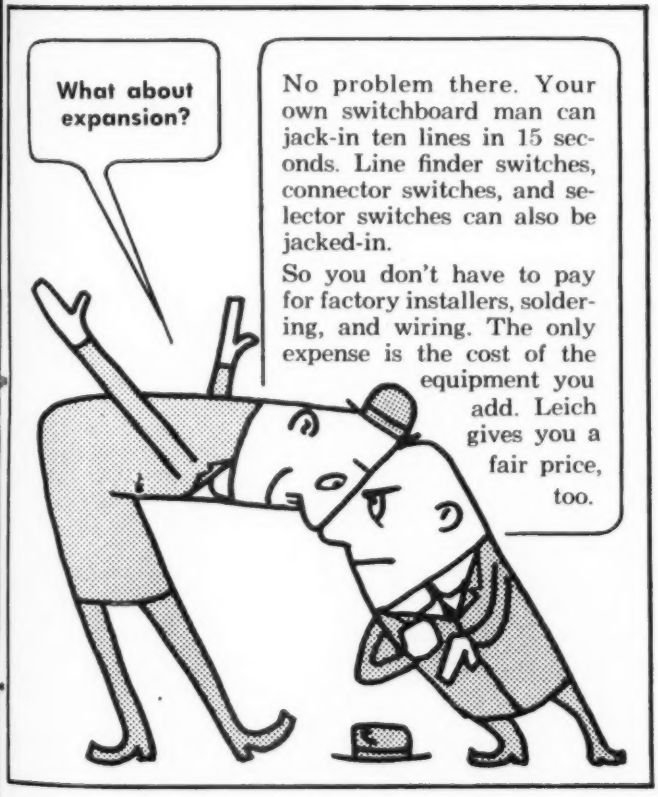


Sounds good. But why does Leich's Dial System save you money?
Because it's an all-relay dial switchboard. Makes it economical to operate. You don't have any elaborate mechanical switching mechanisms to get out of wack. So your dial system does a good job for a long, long time.
Relays really help on maintenance, too.

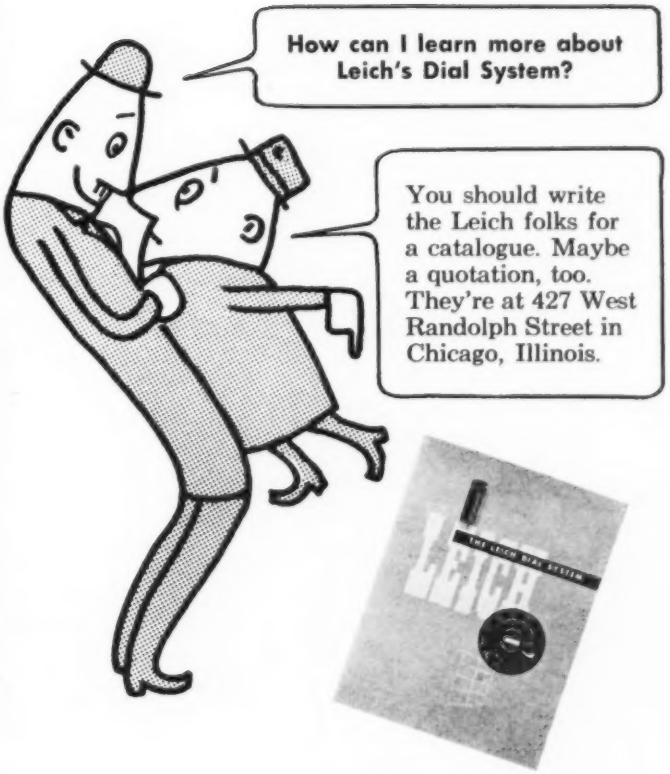

How come?
Leich's relays are dependable. They tell me they've been tested for millions of operations without failure.
And my switchboard man learned the basic maintenance with no trouble. It figures, too, because switchboard men are familiar with relays. They can understand Leich's all-relay system easily.

**LEICH**

LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6, ILLINOIS




What about expansion?
No problem there. Your own switchboard man can jack-in ten lines in 15 seconds. Line finder switches, connector switches, and selector switches can also be jacked-in.
So you don't have to pay for factory installers, soldering, and wiring. The only expense is the cost of the equipment you add. Leich gives you a fair price, too.


How can I learn more about Leich's Dial System?
You should write the Leich folks for a catalogue. Maybe a quotation, too. They're at 427 West Randolph Street in Chicago, Illinois.




**manufacturers of telephones, switchboards and related apparatus since 1907**

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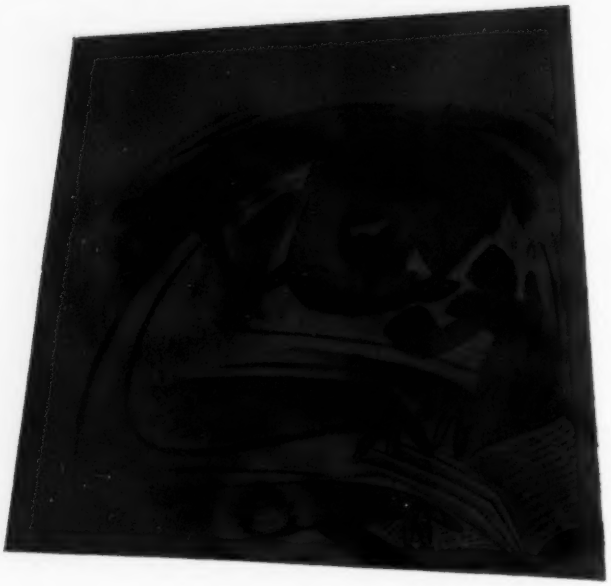
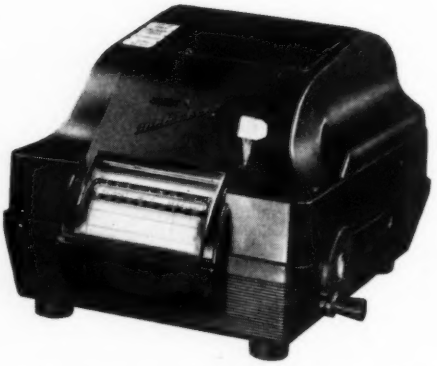


# FOR DIRECTORY-WEARY SUBSCRIBERS

## DIALAPHONE®— the new accessory that makes calling faster, easier



Finding numbers in a bulky phone book is tiring and time-consuming. And now—with Dialaphone—it's unnecessary!

To make a call, the subscriber simply spins a handle; quickly the name of his party appears on a specially-prepared, rotating index. To dial, he merely presses a button. That's all there's to it. *Dialaphone dials the number for him!* What's more, it dials with speed and accuracy—eliminates errors. Up to 850 separate listings can be placed on the index.

For subscribers who use the telephone often, Dialaphone is a wonderful convenience; they'll gladly pay extra for it. *Call your Automatic representative or your nearest A. E. Sales Corporation warehouse.*

| Chicago 7, Ill. | Johnson City, N. Y. | Richmond 21, Va. | Kansas City 8, Mo. | Portland 10, Ore. |
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AUTOMATIC ELECTRIC

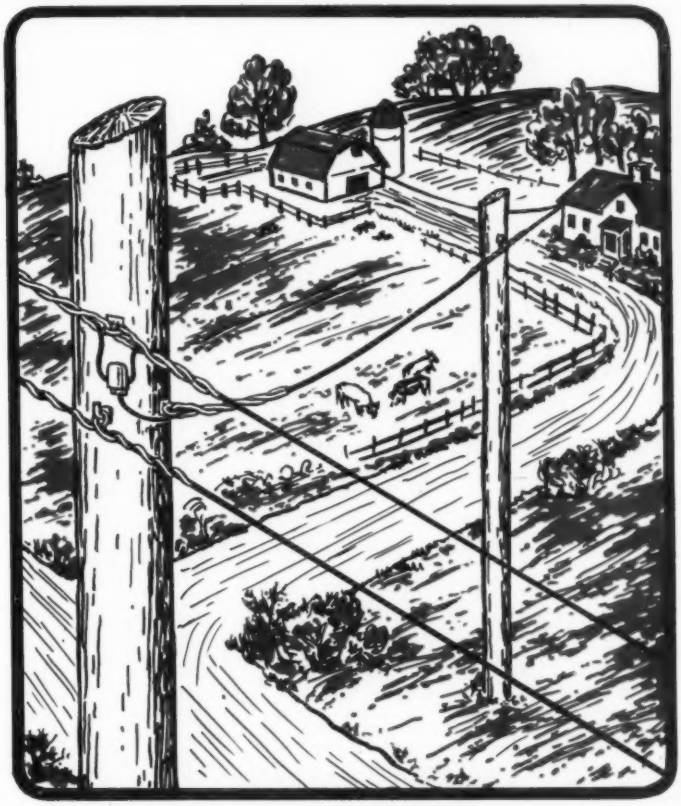
ORIGINATORS OF THE DIAL TELEPHONE

PWC®

ELECTRICAL WIRES, CABLES & CORD SETS

# RUR A LINE
TRADE MARK

## Polyethylene Insulated Line Wire



### A DEPENDABLE INSTALLATION . . .

providing rural extension service at an economical cost. PWC Rur-A-Line is easily installed like a single wire. Maintenance is less than that of open line wire.

Rur-A-Line is moisture and corrosion resistant. It offers excellent protection features with long service life.

PWC Rur-A-Line installations offer the following advantages:

- Excellent transmission characteristics
- Less noise than open line wire
- Long, dependable service life
- Minimum maintenance cost
- Can be installed in parallel with existing cables or open wire

**Rur-A-Line #214**

is designed for normal span installations. Two #14 solid extra high strength copperweld conductors, 30% conductivity, are insulated in parallel. The special polyethylene insulation has excellent weathering characteristics. Colored Black.

OD=.145"x.280" 34 lbs./1000 Ft.

**Rur-A-Line #212**

is designed for long span installations. Two #12 solid extra high strength copperweld conductors, 30% conductivity, are insulated in parallel with the same high molecular wt. Polyethylene insulation as used on #214.

OD=.160"x.315" 51 lbs./1000 Ft.

WRITE FOR PWC PRODUCT BULLETIN #105

PLASTIC WIRE & CABLE CORPORATION

JEWETT CITY, CONN.

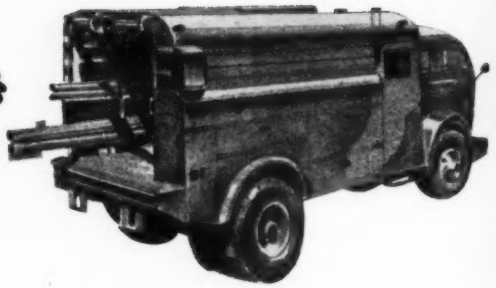


XUM

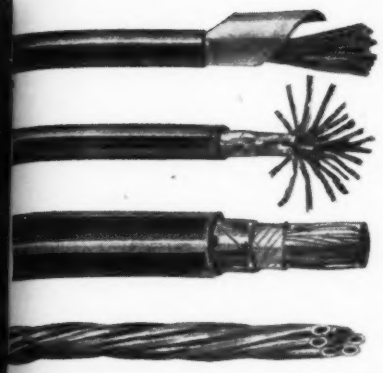
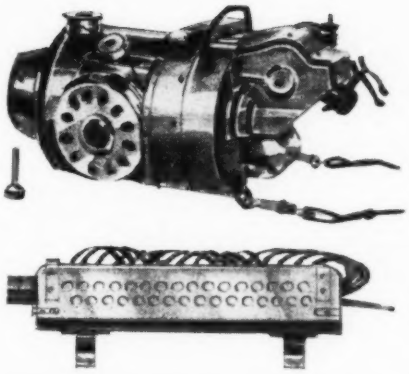
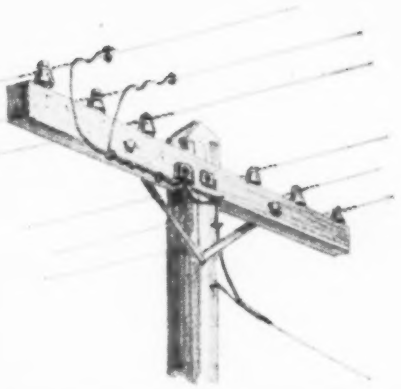
# look "NORTH" for spring construction materials

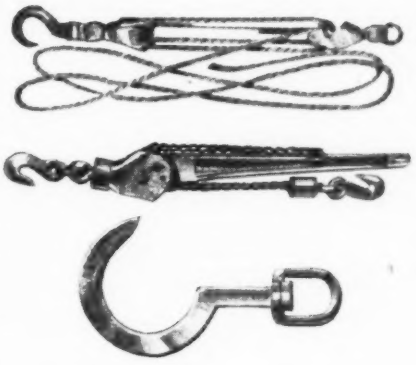
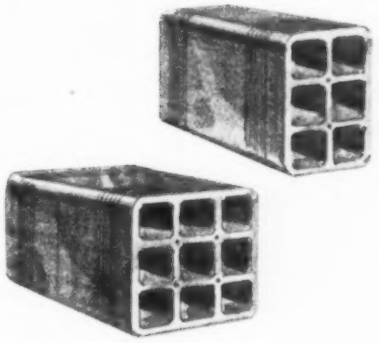
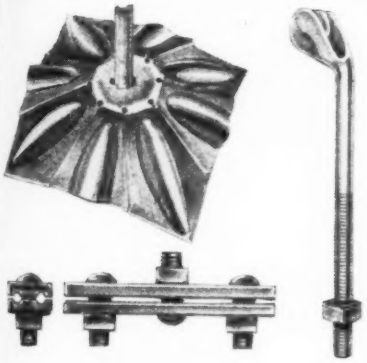
Sound prior planning will help you determine your construction supply needs. North's sales engineers will help you plan — help you order — and schedule your shipments so you'll have the material and supplies you need, when you need them, where you need them.

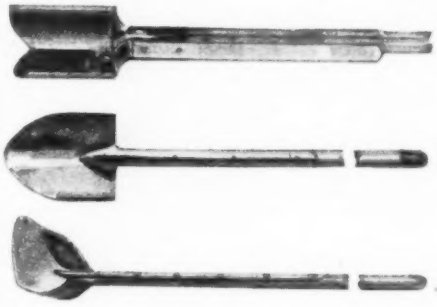
North Electric Company offers a full and complete inventory of construction and line supplies. Ordering from NORTH's conveniently indexed, key-tabbed catalog gives you one source supply for thousands of manufacturers' items. If you do not have the new NORTH catalog — write today.



The most important item in any installation is the telephone. Order the new NORTH N-541 Telephone — the telephone with "Hi-Fi" transmission.



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# NORTH ELECTRIC COMPANY

601 SOUTH MARKET STREET • GALION, OHIO

# Dependable All-Wheel traction

## One of 9 reasons why you'll find International Trucks cost least to own!

Here are 4-wheel-drive and 6x6 trucks that need no roads. They make their own with all wheels *working*.

You get dependable sure-footed traction and extra pulling power to go through sand, mud and snow . . . up the steepest grades with a full load. No need to take the long way around. Ideal for highway hauling, too.

Every INTERNATIONAL All-Wheel-Drive model is completely factory-built for reliable performance and lasting economy . . . built to cost *least* to own.

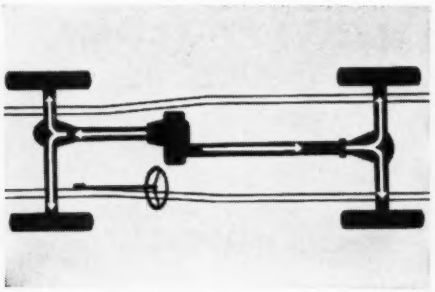
And fleet cost records prove* that INTERNATIONAL Trucks *do* cost least to own.

Why not start *saving* more, *earning* more money right now with the rough-and-ready truck that goes everywhere. Your INTERNATIONAL Dealer is the man to see.

**Signed statements in our files, from fleet owners throughout the U.S., back up this statement.*

INTERNATIONAL HARVESTER COMPANY, CHICAGO
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

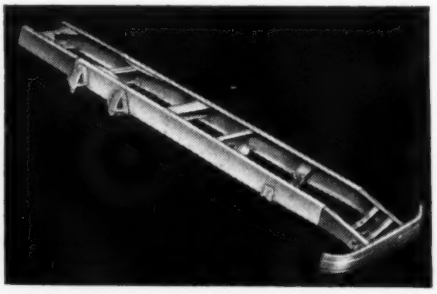
1 **All wheels are working** for you with this INTERNATIONAL 6x6. You get to places never before possible. Rough terrain and hills are easily negotiated. Save valuable time and money. 6x6 models with 22,000 to 43,000 lbs. GVW.



2 **Two-speed transfer case** transmits power from the transmission to front and rear axles or rear axle only. Quiet, cloverleaf design for straight-thru drive, extra dependability and lowest maintenance. Full torque power take-off available.

3 **Brakes with big lining areas** are the self-energizing type for low pedal pressure and sure stops. Sealed to keep out dirt and moisture for greater dependability and reduced service. Power brakes standard or available on all models.

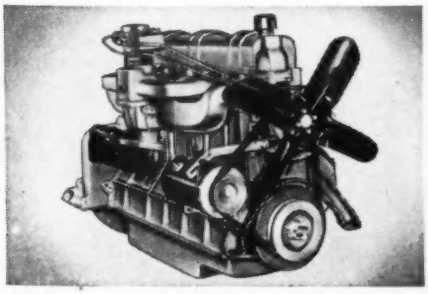
4 **Every cab is a full-sized beauty.** Plenty of leg and head room, 3-man-wide seats. Sturdily constructed with double back walls. Special cab mountings, rugged understructure and bracing to stand up under the most extreme conditions.



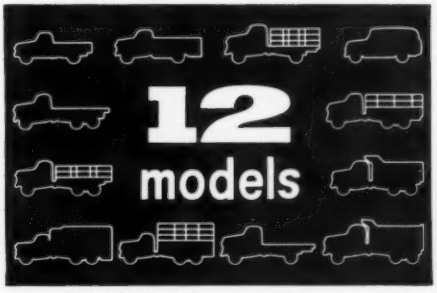
5 **INTERNATIONAL Steel-Flex frames** are constructed with cold squeezed rivets for added strength and durability. S-120 (4x4) models have kickup for extra low loading height. Larger models have full load-length reinforcements.

6 **Easy, positive steering** with over-size cam and roller-mounted twin lever gears. Controls mounted ahead of the front axle. You get greater stability, less shocks, comfortable steering angle . . . best handling on all types of terrain and roads.

This is the popular light-duty Model S-120 (4x4) INTERNATIONAL Truck. Features full-size, 3-man-wide cab and a choice of 12 different full-size, factory-built bodies, including the widest 6½ ft. pickup in the industry. Powered by 131 hp., short stroke, 6-cylinder engine, gasoline or LPG fuel. Available with factory-installed 8,000 or 15,000 lbs. capacity front-mounted winch, snowplow and other specialized equipment.



**7 Dependable, economical power** with sixteen 6-cylinder engines, up to 212 hp. Heat-treated, forged steel crankshafts and big bearing areas for a longer, more useful life. Precision machined, quiet, long lasting timing gears, too.

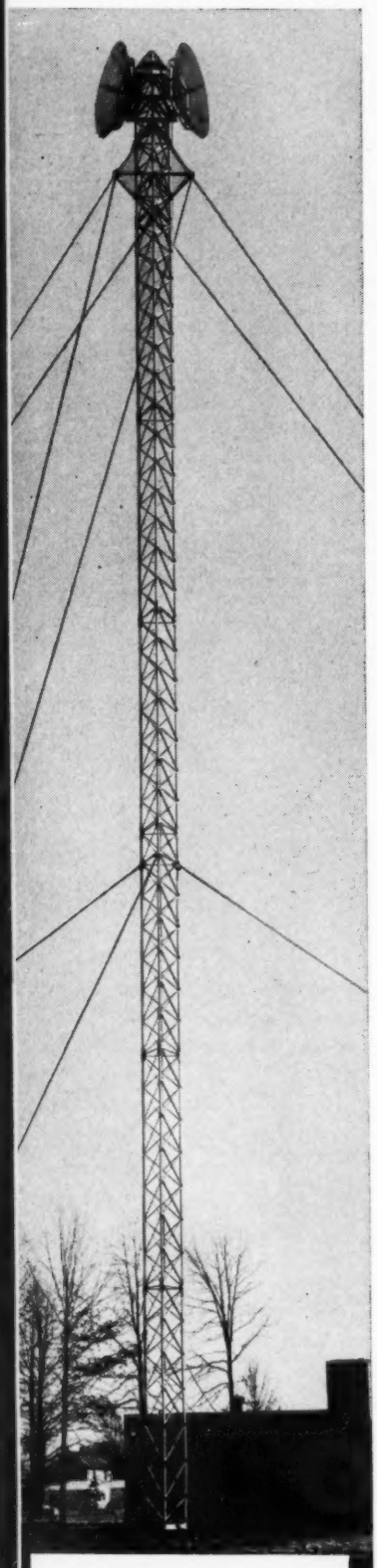



**8 Save time and money.** Get the truck that matches your job *exactly*. No need to compromise with the great span of 12 factory-built INTERNATIONAL 4x4 and 6x6 models, 7,000 to 43,000 lbs. GVW. Choice of job-matched components.

**9 World's most complete line.** There is an INTERNATIONAL "tailor-made" for every truck job, ½ tonners to 90,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own.

# Planning expansion?

## Microwave may be the answer ...and Blaw-Knox has the towers



Special Blaw-Knox guyed tower for microwave communications

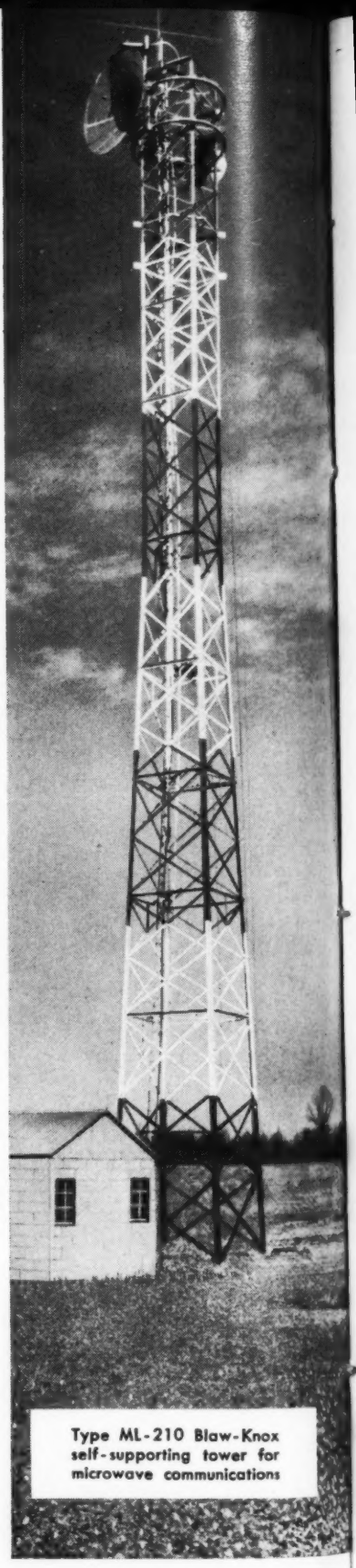
Improved service, reduced maintenance, and economy records of pioneer microwave installations are responsible for many telephone companies plotting additional right-of-ways through the sky. Quite possibly, microwave can best answer your growth problems, and Blaw-Knox can best answer your tower questions.

Blaw-Knox Microwave Tower designs are based on more than 40 years of experience in building towers. For example:

- The first Blaw-Knox Towers, four 300′ self-supporting towers erected over 40 years ago in Alaska, still stand in good service.
- The world's first atom bomb was supported by a Blaw-Knox Tower, ushering in the Atomic Age at Alamogordo, New Mexico, in 1945.
- First electronic contact was made with outer space by a radar signal to the moon, beamed from a Blaw-Knox Tower.

From such varied experience as this, Blaw-Knox engineers are well qualified to design and engineer the type of tower system that will best meet your present and future requirements. Blaw-Knox Microwave Towers meet or surpass government standards and recommendations of the Radio-Electronics-Television Manufacturers Association for safety, wind loading and quality of construction.

Get the full story of Blaw-Knox Tower design, engineering and fabrication services. Write today for your free copy of new Bulletin 2538.



Type ML-210 Blaw-Knox self-supporting tower for microwave communications

BLAW-KNOX

**BLAW-KNOX COMPANY**
*Equipment Division*
*Pittsburgh 38, Pennsylvania*

**MICROWAVE TOWERS**
Guyed and self-supporting Microwave Towers, custom-built for each installation... and Transmission Towers... Antenna Towers—guyed and self-supporting for AM-FM-TV, Radar... parabolic antennas and other special structures

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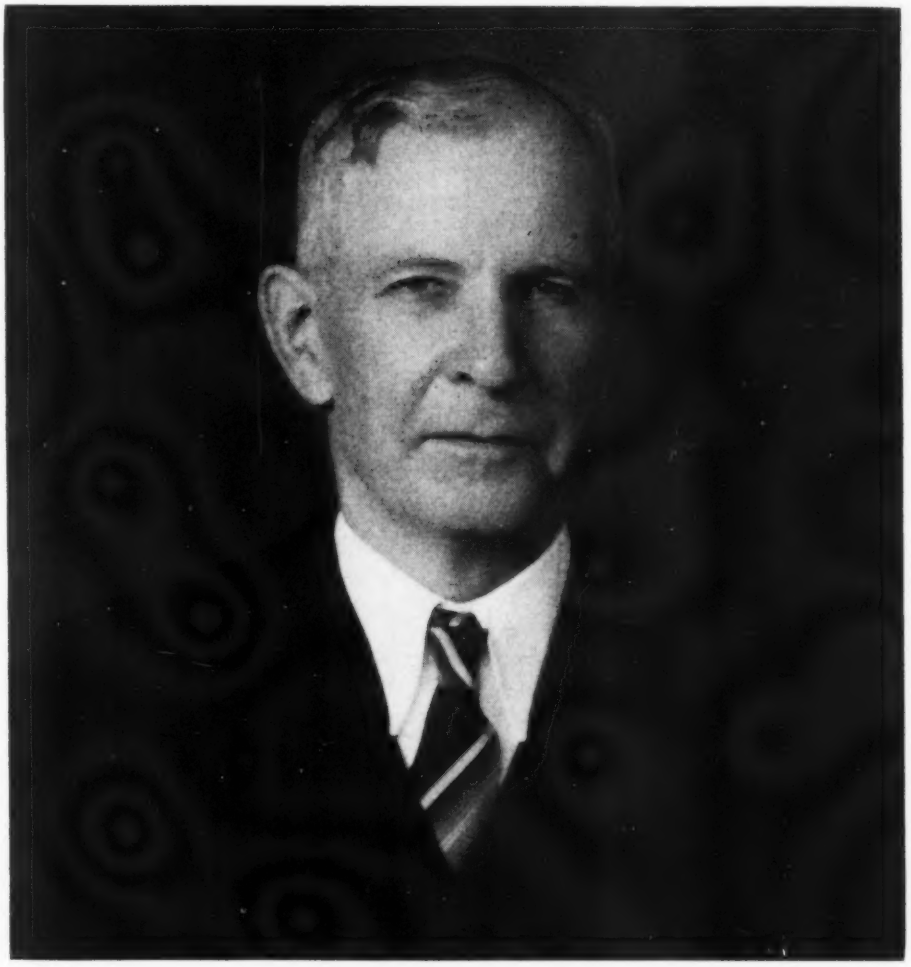

# H. D. Fargo of Telephony Dies

HIRAM D. FARGO, vice president and treasurer of TELEPHONY, died on Feb. 12 in Evanston, Ill., one month after observing his 50th year of service to the journal and the industry he helped to build. He was 88 and had been hospitalized for virus pneumonia.

On the occasion of his 50th anniversary, the staff of TELEPHONY paid tribute to him in this journal's January 19 issue.

Mr. Fargo was born on Nov. 6, 1868 in Ionia, Mich. He entered the newspaper business at the age of 17 in Ionia, and a year later joined the staff of the Santa Ana (Cal.) *Blade*. He remained in California for two years and in 1889 he went to Chicago and joined the City News Bureau, two years later becoming a reporter for the old Chicago *Evening Post*. From 1894 to 1906 he served the *Post* as political editor and Washington correspondent.

Mr. Fargo joined TELEPHONY in January, 1907 as secretary-treasurer and co-editor. In 1919 he was elected president and treasurer and held these positions until Jan. 21, 1941, when he turned over the responsibilities of president to his son, H. D. Fargo, Jr., who had been associated with the publication for 20 years. "Senior" Fargo, as he was affectionately called by his friends, then became vice president and treasurer. He was active in this post until he was hospitalized. He was a life member of the Independent Telephone Pioneer Association.

He had been a member of the Epworth Methodist Church in Chicago since 1903 and was a long-time member of its official board. He was also a member of the Chicago Press Veterans Association and the old Press Club of Chicago. Active in golf circles since 1911, he had been a member of the Illinois Seniors Golf Association for many years, and an honorary member in recent years.

He is survived by his son, H. D. Jr.; three grandsons, Dan S., managing editor of TELEPHONY; David L., and Joseph D.; a granddaughter, Mrs. Robert S. Drew Jr., and four great-grandsons.



XUM

# IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

**California commission gives Bell company permission to file rates for industrial mobile telephone service. FCC describes microwave service and highlights its problem of allocating radio frequencies for various uses.**

THE CALIFORNIA commission has finally ruled in favor of the request of the Pacific Telephone & Telegraph Co. for permission to file tariffs for mobile telephone service. This request will have the effect of establishing a standard rate schedule for mobile-type telephone service used by industries for system-wide operations and by taxicabs and truck fleet operators and others having special need for such mobile service.

What makes this California case of special interest to the entire telephone industry was the strenuous objections raised by the Petroleum Industries Electrical Association and other industrial users of private communication services. It appears that Pacific Telephone & Telegraph Co. has been leasing equipment to trucking, oil, taxicab, and other companies by individual contracts, and will now be able to establish this service under a formal rate schedule.

But the Petroleum Industries Electrical Association had contended that this was not a public utility service and should not be so regulated. It was further charged that the telephone company's move would evade anti-trust restrictions on the telephone company's activity in the radio-telephone field. The California commission's decision is clearly a precedent on the basic issue of whether such service can or cannot be regulated as part of a telephone company's obligation to the telephone using public.

The protesting groups included some 15 industrial users or manufacturers of private mobile communications equipment, together with the city of Los Angeles and a member of the House of Representatives. Among other things it was claimed that Pacific Telephone & Telegraph Co. is simply engaged in a maneuver to establish an area service monopoly on behalf of the telephone industry, and that if it is successful it would adversely affect competitive private monopoly telephone operations generally.

The testimony before the California commission included an appearance by Rep. James Roosevelt (D., Cal.), on behalf of the House Small Business Subcommittee. He contended the filings would subvert the recent consent decree ending the federal government's anti-trust suit against the Bell System and its manufacturing subsidiary, Western Electric Co. He charged that the California telephone company filings were part of a strategy by telephone companies to shift their private communication services (not previously subjected to regulation) over to control by the state commission, so as to remove them from operation of the consent decree.

The decision of the California Public Utilities Commission was to the effect that mobile telephone service, when it is undertaken by a telephone company, is a public utility service and, as such, is subject to regulation (as to rates and other matters) by the California commission. There were a number of other subordinate rulings, including the following six more important points:

(1) That furnishing mobile radiotelephone service and equipment, on a lease and maintenance basis by a telephone company is a proper, useful, and lawful adjunct of regular land line telephone public utility service;

(2) That such service is subject to rate regulation under tariffs filed with the state commission and is not precluded by the Federal Communications Act;

(3) That the fears of protesting private operators that the telephone companies might use this type of service to secure ultimate control over all radio wave lengths now devoted to private communications were not proven to be well founded, especially since this could be done only by order of the Federal Communications Commission;

(4) That the Bell System company's presence in the competitive field of mobile radio-telephone service should not be barred on protest of parties who are themselves competitors and who are apparently only fearful of business advantages which a competitive land line telephone company might obtain in such operations;

(5) That the state commission does not have authority to regulate private operators in this field, who do not hold themselves out to be rendering telephone utility service; and

(6) That the rates proposed for this service by the Pacific Telephone & Telegraph Co. were reasonable and adequate under present circumstances.

### *The Monopoly Issue*

The most interesting argument made by the protestants in this case was that mobile telephone service, when rendered (as proposed in this case) by a telephone company, is not a telephone service but an equipment service. The protestants contended that the mere leasing, installation, or maintenance of radio equipment for private mobile radio or any combination of these activities is a highly competitive industry in which over a hundred persons are directly engaged in California alone.

But the Pacific Telephone & Telegraph Co. argued to the contrary that as far as a telephone company is concerned, there is nothing unusual in the fact that a regulated public utility and an unregulated private enterprise may be furnishing the same or similar services in the same locality. The difference is that in the case of the telephone company the services are a supplementary part of the company's responsibility in carrying out of its service obligation.

What's more, it was suggested that

barring the telephone company from such service would damage the telephone-using public, because the company would be unable to furnish a host of potential subscribers having special need for mobile communications. Pacific pointed to some 225 pending inquiries from various sources, including government agencies, law enforcement agencies, utility companies (other than telephone companies), hospitals, newspapers, labor unions, farmers, food and feed business, oil companies, mining companies, taxicab companies, express companies, builders, contractors, lumber companies, banks, warehouses, and many others.

The commission agreed with this latter point of view, stating:

"Pacific is definitely a public utility under the California constitution and the public utilities code; it is not only willing now to dedicate its mobile communication property to the public service in private automobiles for private as well as public mobile communication service and to file tariffs as required by the public utilities code, but we hereby find that it has in fact so dedicated its property and service."

Congressman Roosevelt not only claimed that the filing of the California tariffs in this case was part of the strategy to evade the recent Bell System consent decree, but he also indicated that he did not think much of the decree itself. The commission's opinion (33 pages in length, by the way) refers to Representative Roosevelt's testimony as follows:

"He also indicated that not only does the consent decree fail to accomplish what the government endeavored to do seven years ago (when it started the anti-trust suit), but it actually assists big business to the detriment of the independent and small businesses. He contended that by that decree the monopoly position of the applicant may be even further extended into the area of private communications. He gave his considered opinion that the free enterprise system of our country and the over-all benefit of all California citizens will best be protected by denying the present tariff filing of the applicant."

As to these claims, the commission's opinion took the following contrary view:

"We are not convinced that Pacific's presence in the field will constitute any threat to the continued vigor of its competitors. It should not, does not propose to, and will not be allowed to favor its own private mobile customers by way of connections with its 'land lines' not allowed to the customers of its competitors. It will be required to maintain charges which are fully compensatory. It will be under the disadvantage of being unable to enter into price competition with its competitors to secure the business of particularly desirable customers; and it will be required to serve customers its competitors may not elect to serve. There is no danger here which would justify our going to the legislature to ask to be relieved of the duty which the law now imposes upon us to regulate the service."

The commission went on to say that as far as competition was concerned, it was likely to be more unfair to the regulated than to the unregulated, because of the restrictions imposed by law and by commission rule on the telephone utility company. Referring to the consent decree, the California commission opinion stated:

". . . If the federal court had wished to bar such activities by the applicant [Pacific] even though subjected to regulation, it would have made such provision and the question would not be before this commission. So far as the effect of the consent decree is concerned, it is not actually pertinent to the issues in this case. If the proposed service would be utility service in the absence of that decree, it is still utility service. If we held this service to be utility in nature in the gas company cases before the consent decree, there is nothing in the consent decree to prompt us to change our holding. If our previous holding that this service is utility in nature, distasteful to Pacific at the time it was made, now turns out because of the consent decree to be beneficial to the applicant, that in no wise affects the validity of our previous holding."

One other interesting sidelight was seen in an objection by the commission's own staff based on Pacific's "held order" list. The staff contended that, until the telephone company caught up with its "held order" list, it ought to devote its full time and attention entirely to regular land-line telephone

*(Please turn to page 34)*

## REA Makes Two Telephone Loans

**The U. S. Department of Agriculture (on Feb. 5) announced two loans made by the Rural Electrification Administration to improve and expand telephone service in rural areas of Kentucky and Texas. These loans totaling $457,000 will provide new or improved service for 826 rural subscribers. Details follow:**

**South Central Rural Telephone Cooperative Corp., Glasgow, Ky.; $317,000, third loan (Jan. 31).**

**The borrower will use these funds to furnish new or improved service to 514 subscribers, 216 of which are farm families now receiving magneto service through central offices at Buffalo and Magnolia by the Buffalo Telephone Co. and the Magnolia Telephone Co. The South Central cooperative proposes to acquire these facilities with funds of its own.**

**Present plans of the cooperative include automatic central offices to replace the magneto facilities at Buffalo and Magnolia, and 91 miles of new line.**

**A portion of the loan will be used to complete construction authorized under two previous loans to the borrower.**

**The cooperative has received REA loans totaling $2,790,000, and now has 12 automatic exchanges in operation serving around 3,500 rural subscribers. The completed system will serve 5,600 subscribers. It will consist of 14 exchanges.**

**Robert E. Eaton is president and Daniel B. Corman is manager of the South Central Rural Telephone Cooperative Corp.**

**Mid-Texas Telephone Co., 731 N. St. Mary's Street, San Antonio, Tex.; $140,000, second loan (Jan. 31).**

**The borrower plans to use these funds to expand its operating area in Bell County, bringing service to 120 rural families now without telephones, and improved service to 192 subscribers. Mid-Texas has acquired the territory through purchase of the Big State Telephone Co. at Holland.**

**The borrower's construction plans include an automatic central office to replace the present magneto office at Holland.**

**The two REA loans to Mid-State, totaling $1,990,000, will enable it to provide new and improved service to 7,832 subscribers. The completed system will include automatic exchanges at Holland, Killeen, Copperas Cove and Nolanville. The latter two are in operation serving approximately 600 subscribers in those communities.**

**W. S. Bain is president and manager of Mid-Texas Telephone Co.**



XUM

# A B C of the Telephone

*by Frank E. Lee*

A TELEPHONE pole has one primary purpose—to hold wires or cables a certain distance above the ground. In doing this job the bulk of the static weight of the load exerts a down pressure on the pole. If this were the only load a pole had to carry it could be much smaller in diameter. Instead the pole must also be strong enough to withstand the side-thrust caused by the wind blowing against the outside plant supported by the pole.

The side-thrust on a pole or a pole line, for that matter, has dynamic characteristics. On a quiet summer day, when little breeze is stirring, the side-thrust or cross-thrust is practically nil. During a storm or when the seasons are changing the wind may be quite strong.

This means a big difference in cross-thrust, too. If the outside plant is covered with a heavy layer of sleet the down weight is increased and the cross-sectional area exposed to the wind is also increased. This means a greater cross-thrust on the pole.

The basic strength of a proper size pole for the line is sufficient to withstand a certain amount of cross-thrust. In fact, a pole can safely support some degree of continuous sideways pull. However, the amount of sideways pull that can be placed on a pole must be limited to maintain the necessary margins of safety desirable in the building of outside plant.

Situations arise a countless number of times when a pole or group of poles must be strengthened to offset the effects of excessive cross-thrust caused by strong winds. Sideways pull must be offset when a corner or curve is introduced into a pole line. On other occasions a pole line is dead-ended. In this instance, the tension on the open wire or cable leads places a heavy stress on the end pole. This stress also is noticeable on the poles adjacent to the end pole.

**PART 79. OUTSIDE PLANT CONSTRUCTION—Section 5, Guy Wires. Section 1 (TELEPHONY, No. 17, 1956) discussed planning of additions to the outside plant. Section 2 (TELEPHONY, Nov. 24, 1956) covered laying out the pole line, grading requirements and a résumé of clearances to be observed in outside plant construction. Section 3 (TELEPHONY, Dec. 1, 1956) was based on poles, their selection, treatment, handling, storage, and gaining. Section 4 (TELEPHONY, Dec. 8, 1956) showed how the use of power equipment can save construction time. Also included is information on the depth poles are set in various types of soil.**

Guy wires are used to counteract the effect of the cross-thrusts and sideways pull to which a pole may be subjected. In actual practice, these guy wires may be given one of a number of names, such as "dead-end guy," "storm guy," "longitudinal head guy," "corner guy," "side guy," and similar names.

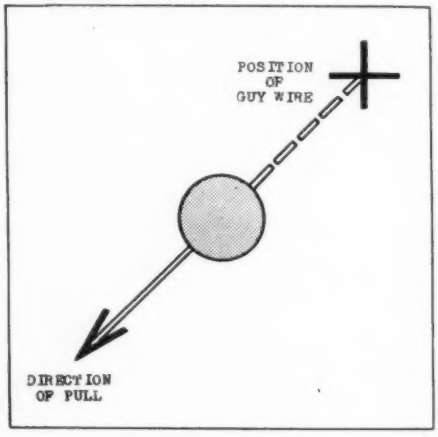


Fig. 1.

Generally speaking, all guy wires serve the same basic purpose—to counteract the pull or stress on a pole or, sometimes, on a group of poles.

In placing a guy wire, a number of important factors must be considered. These factors will be discussed individually a little later in this article. However, for the moment, it would be well to consider an example to realize how much a properly placed guy wire will strengthen a pole.

In this example, consider a man standing on top of a silo or grain elevator in the center of a circular iron railing about 3 feet high and 4 feet in diameter. On a quiet summer day the man could easily stand in the center of the railing, with his feet together, with little fear that he would lose his balance.

On a day when a high wind is blowing the man would most likely lose his balance if he continued to keep his feet together. To counteract the force of the wind and still keep his feet together, he would have to reach out with one of his arms and grasp the railing where he secured the greatest support. If the wind was changeable and continued strong he probably would use both hands and grasp the railing so as to brace himself against a shifting force.

In this example, the man needs an additional support to maintain his balance. The extra support in this instance was provided by the man reaching out an arm and grasping the rail where he would secure the most support. Under a similar set of circumstances, a pole, carrying open wires, cable or some other types of outside plant, also requires added support.

The most practical way to provide

extra support for a pole is to place a guy wire to offset the side-thrust or pull that may be exerted against the pole. A basic example of the function performed by a guy wire is illustrated in *Fig. 1*. The position of the arrow indicates the direction of pull or thrust against a pole. The guy wire indicated by the dotted line is placed in a position where its support will be opposite—and thus will counteract—the effect of the pull on the pole.

It is interesting to consider the various ways in which a pole can be subjected to a pull or side-thrust. The situation in *Fig. 2* is easy to visualize because the load is practically identical to *Fig. 1*.

In this instance, a pole line supporting a lashed cable lead is terminated at a dead-end pole. If the dead-end guy wire were omitted, an undue strain would be placed not only on the end pole but on a number of poles adjacent to the end pole.

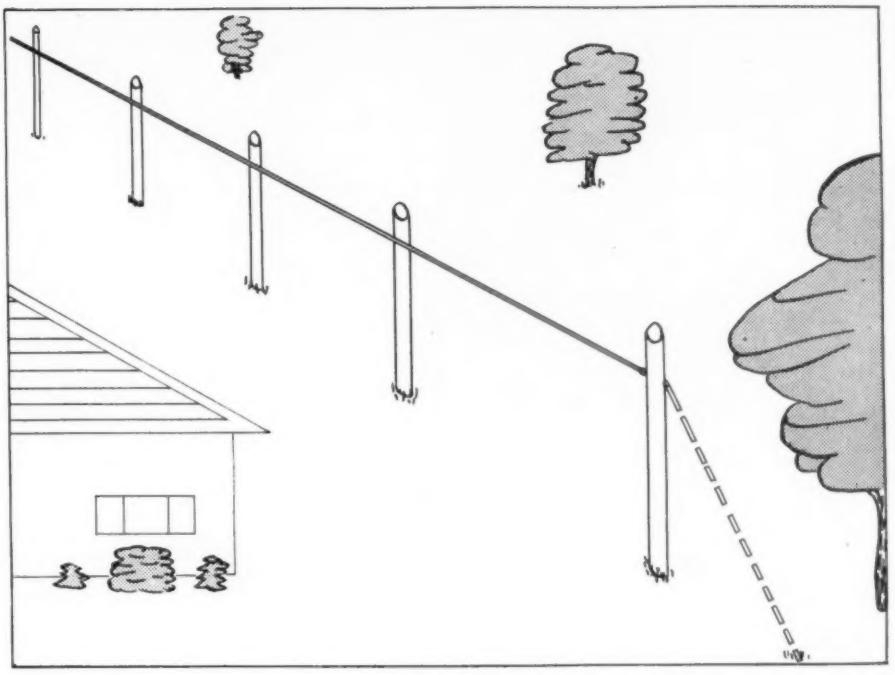

Fig. 2.

### *Determining the Pull on A Pole*

The load placed on a corner pole is a combined load that varies with the degree that the direction of the line changes at the particular corner. For example, the corner illustrated in *Fig. 3A* results in a greater change in direction of the line than does the corner in *Fig. 3B*. In *Fig. 3A*, the direction change is 45 degrees and in *Fig. 3B* it is 30 degrees. The usual way of describing how much a given change in direction affects a corner pole is to express the added load in number of feet of pull.

The pull on a pole is expressed as the distance in feet that a corner pole is out of line with two points established along each leg of the line 100 feet from the pole. When this formula is applied to a 30-degree and a 45-degree corner, as shown in *Fig. 4*, it will be noted that the pull on the pole increases as the change in direction of the line increases.

After studying *Fig. 4* one may wonder why the load on the corner pole is expressed in feet of pull instead of in number of degrees of direction change of the line. The most logical answer is that the number of feet of pull can be determined quite accurately without using measuring instruments. If necessary, a lineman could pace off the required distances and arrive at the proper calculation. This is another example of how a procedure or term often continues in use long after it has served its most useful purpose.

*Fig. 5* illustrates other methods that can be used to determine the pull on a pole.

In *Fig. 5A*, the initial measurements are extended 100 feet beyond the corner pole. Since this is a simple inversion of the angles being measured the amount of pull is the same as if the measurement were taken as shown in *Fig. 4*.

In *Fig. 5B*, a measurement is taken along one leg of the line from the corner pole. The second measurement is taken along an extended line from the other leg of the line. In this instance the pull is measured between the two points instead of from the pole to a line drawn between the two points as shown in the other examples.

The length of each measured leg is reduced one-half to 50 feet because angle A is two times greater than angle B or angle C. In other words, the sides of angle A are separating twice as fast as are the sides of angle B or angle C. Thus to obtain an equivalent pull measurement the sides of angle A are reduced in length by one half.

### *Use of Pull Data*

The amount of pull to which a pole is subjected plus the load the pole is carrying are factors used to determine whether or not a pole should be strengthened with a guy wire. If a guy wire is required the pull data will

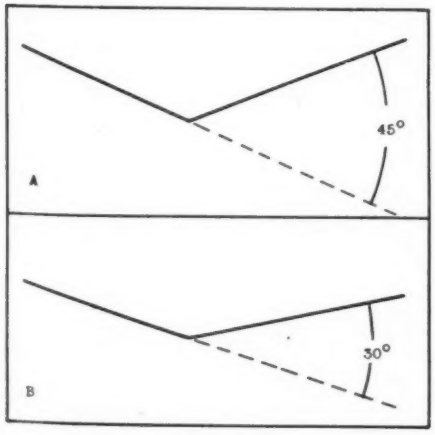


Fig. 3.

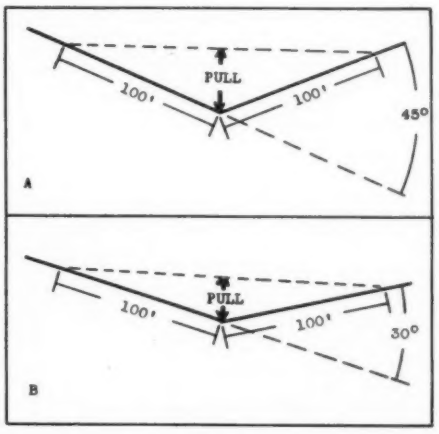


Fig. 4.

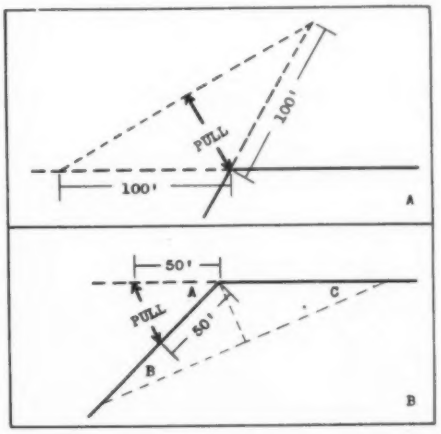


Fig. 5.



XUM

assist in the selection of the correct size guy wire.

A pole set in average soil can withstand a certain amount of pull or side-thrust. The data in *Table 1* has been used for a number of years as a good yardstick to determine when the pull is of sufficient consequence to warrant the installation of a supporting guy wire.

From a review of *Table 1* it will be noted that the amount of allowable pull on an unguyed pole is quite liberal when the pole is supporting a light load. However, as the load on the pole increases the allowable pull is reduced quite drastically. This means that guy wires should be considered whenever a heavily loaded pole line turns just a few degrees away from a straight line.

This situation serves as another example to stress the importance of laying out a proposed line as accurately as possible. Many of the factors involved in laying out a pole line were discussed in *Part 76* of this series (TELEPHONY, Nov. 24, 1956, p. 30).

### *Principles of Guying*

The effective strength or support provided by any guy wire installation is determined by a number of factors, namely:

(1) Height that the guy wire is attached on the pole.
(2) Location of the guy wire anchor.
(3) Effectiveness of the anchor.
(4) Size of the guy wire.

The holding power of a guy wire is based on certain fundamental engineering principles which, when properly understood and applied, are helpful in studying this part of the outside plant construction job. These terms are as follows:

*Ground Line.* When applied to a guy wire installation the ground line is the place where the anchor rod, to which the guy wire is attached, enters the ground. From this it can be seen that the contour of the ground has a direct bearing on whether the guy ground line is above or below the pole ground line, as illustrated in *Fig. 6.*

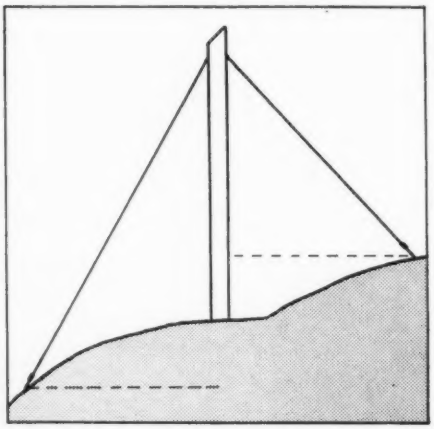

Fig. 6.

| WIRES ATTACHED TO POLE OR EQUIVALENT LOAD | ALLOWABLE PULL IN FEET ON UNGUYED POLE IN EACH LOADING AREA | | |
|---|---|---|---|
| | Light Loading Area | Medium Loading Area | Heavy Loading Area |
| 1 - 2 | 20 | 20 | 15 |
| 3 - 6 | 8 | 8 | 6 |
| 7 - 10 | 6 | 6 | 4 |
| 11 - 20 | 4 | 4 | 3 |
| 21 - 30 | 3 | 3 | 2 |
| 31 - 50 | 2 | 2 | 1 |
| 51 - 60 | 1 | 1 | 1 |

**Table 1. Maximum allowable pull on unguyed corner pole.**

*Height.* The height of a guy installation is the vertical measurement from the guy ground line to the point where the guy wire is attached to the pole.

*Lead.* This is the term given to the horizontal measurement between the guy ground line and the point where the guy is attached to the pole.

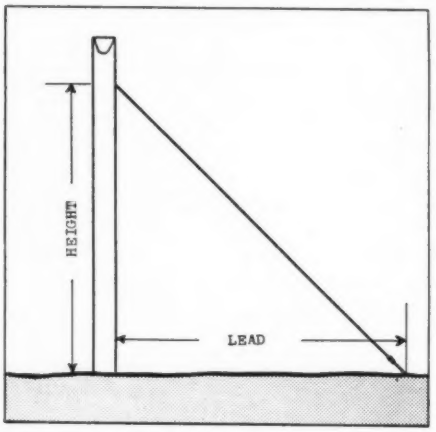


Fig. 7.

From these definitions it will be noted that the lead measurement is on a horizontal plane and the height measurement is in a vertical plane. As a result, the junction of these two planes always forms a right or 90-degree angle, as shown in *Fig. 7.* When an end pole or corner pole is set on an angle to compensate for the pull, the calculations of the height and lead dimensions will be simplified if this right angle relationship is kept in mind.

After looking at *Fig. 7,* it is interesting to re-examine *Fig. 6* to compare the difference in the height dimension when applied first to the left guy wire and then to the right guy wire. It will be noted that the height of the guy wire on the left is considerably greater than the height of the guy wire on the right.

The terms height and lead are considered on the basis of a height-to-lead ratio. This is a way of expressing the leverage or efficiency of a guy wire as it supports the load it is designed to carry. If a guy wire were attached to an anchor placed up against a pole the guy wire would not provide much additional support for the pole.

In fact, for all practical purposes the result would be almost the same as using no anchor at all. As the anchor location is moved away from the pole, the pull of the guy becomes more effective.

*Fig. 8* illustrates how the pull of a guy wire becomes more effective as the anchor is moved away from the pole. The heavy arrow near the top of the pole illustrates that the most effective direction of pull would be a straight line, or 180 degrees away from the load. Seldom is it possible to achieve a similar ideal location or position for a guy wire.

However, as with many other situations, the answer lies in coming as near as possible to the ideal solution. In this instance, the guy wire position that comes nearest to a straight line pull away from the load will be the most effective.

In the illustration, the guy wire furthest from the pole, shown by the heavy line, provides the greatest amount of support. The progressively lighter lines nearer the pole indicate that the effect of the guy wire is re-

*(Please turn to page 44)*

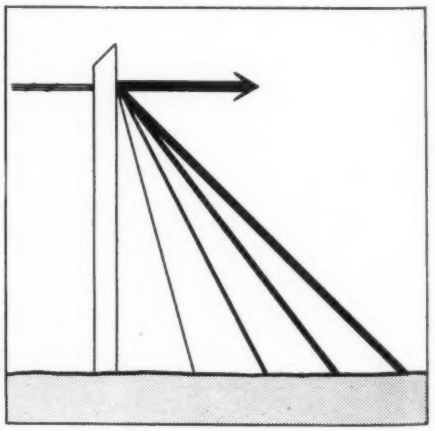

Fig. 8.

# THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

WORKMEN in New Jersey recently fought a 730-foot conduit under the New Jersey Turnpike for two weeks in an attempt to get a line through it. The line was to be used to pull in a fire alarm cable. They tried rats, ferrets, and mongooses in an attempt to send them through the long conduit with strings taped to them. Some died, some bit off the string, and others just cowered inside —even with a female waiting for them at the exit.

The workers then turned to "snakes" or "fish wire." This wire was fed into the conduit from each end and when the two lengths met in the center of the conduit, they were hooked together by a ball and socket arrangement.

Perhaps there may be a better method but we have always had very good luck in using compressed air to blow a line through a length of crooked conduit where duct rods cannot be used. If a light line is attached to a rubber ball of the proper size to ride through the conduit, the air will usually force it along at a rapid rate.

•

We recently obtained a most attractive ball point pen desk set that makes use of a colored bantam-sized telephone for the base. These sets, in all of the popular colors, are produced by the Junior Achievement Tel-A-Pen Co. in San Diego, Cal. This company has found a ready market for its product and is now busy taking orders for future deliveries.

Advisers to this company are Pacific Telephone & Telegraph Co. employes W. H. Parker, La Mesa commercial; H. R. Lewis, San Diego division plant safety supervisor, and A. D. Kluge, commercial service engineer.

Anyone who has a need for one or more of these attractive sets should write this company at 1122—7th Ave., San Diego, Cal. The price is $2.95 each, postpaid. The sets are available with telephone base in all colors, with pens in red, white and black trimmed in gold.

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Our safety-conscious industry has for years searched for a good and serviceable safe ladder. Wooden ladders have done a wonderful job but must be carefully maintained and watched in order to make certain that they do not develop defects which will cause accidents before they are discarded. Metal ladders are safe from a maintenance and strength standpoint but, due to their conduction qualities, many are afraid to make use of them around current-carrying circuits.

It now appears that the recently developed light-weight reinforced plastic ladders may be the answer to the safety engineer's prayer and a boon to our accident-conscious industry.

It is claimed that this new Fiber Glass ladder combines the superior strength-to-weight ratio of light-weight metal ladders with the non-conducting qualities of wood ladders. This Fiber Glass ladder takes full advantage of the same modern, tough Fiber Glass sandwich construction so successfully used in the fabrication of boats, airplanes and automobile bodies by moulding Fiber Glass reinforced plastic over a balsa wood core.

Through an exclusive manufacturing process, this ladder combines Fiber Glass reinforced side rails with non-twisting aluminum or magnesium rungs which are plastic-welded to become an integral part of the ladder. The result is a smooth, splinter-free ladder that provides extreme ease of handling.

A series of tests, conducted by an independent testing laboratory prior to this new ladder's acceptance by the utilities industry, reveal strength-to-weight ratios exceeding those of most metals, and durability far exceeding that of wood, due to superior resistance to chemicals, heat and water.

The following sizes of this new ladder are currently available:

| | Approx. Weight/Ft. |
|---|---|
| 8 feet to 16 feet Standard duty single | 2 lbs. |
| 16 feet to 28 feet Standard duty extension | 2¼ lbs. |
| 8 feet to 20 feet Heavy duty single | 2¼ lbs. |
| 16 feet to 40 feet Heavy duty extension | 2½ lbs. |

Single ladders are made with either tapering or straight sides. Tapering ladders are approximately 14 inches wide at top and taper ¼ inch to the foot, while the straight ladders are approximately 16½ inches wide. Extension ladders are made with the bottom

section approximately 18½ inches wide, and the top section approximately 15½ inches wide.

•

*The Engineer,* published by the Western Electric Co., gives us the following interesting information on the undersea repeaters used on the transatlantic submarine telephone cable:

"Voices travel 2,250 miles under the sea, an achievement in transmission made possible by the use of specially designed carrier-repeaters. Spaced at 40-mile intervals in the twin cables spanning the Atlantic are 102 carrier-repeaters, each containing a three-stage electron tube amplifier. The repeaters lie on the ocean floor at a depth, in places, of 2½ miles where the pressure is approximately 7000 pounds per square inch. . . .

"Most telephone equipment is, at least, physically available for preventive and corrective maintenance at reasonable cost. Not so in the case of the electronic repeaters at the bottom of the sea. They are economically inaccessible for maintenance.

"To recover them for repair or replacement would be extremely costly —an estimated quarter of a million dollars at a minimum. Failure of a single repeater would immediately render all 36 channels inoperative until repairs are made.

"On the other hand, to meet the service and cost objectives of the transatlantic cable project, the system must operate virtually without maintenance for at least 20 years.

"Thus, in the manufacture of repeaters for the transatlantic cable, W.E.'s general manufacturing philosophy was carried to its logical extreme. The economies of the job required it.

"In light of the established objectives, it was obvious that production costs would far exceed those of any land-based apparatus of comparable design. But the over-all economics of the system justified that expenditure. Thus a philosophy of equality became a philosophy of perfection. . . .

"Thus, W.E.'s job came down to this: to develop procedures and safeguards to insure that the fundamental service would be accomplished, that every calculated risk would be eliminated—and all within the context of the project's over-all economics and its stringent schedule.

"This called for the nicest discrimination on the part of the engineers as to the point where the pursuit of perfection would yield no further significant returns. This evaluation—which defies exact definition in the usual terms of specifications or tolerances—had to be uniform over the entire project and required the closest cooperation of all concerned. It came down, in the final analysis, to a matter of engineering judgment—informed judgment, uncompromisingly critical, motivated above all other considerations by a philosophy of perfection."

# Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

**Q. Recently, we've strung about a mile of 26-pair, 22 gauge plastic cable. This cable is attached to a ¼-inch messenger strand by the spinner method. The spans are from 150 to 200 feet with a sag of about 20 inches in each span. Now, we are told that we will not be able to maintain this cable as it will dance and jump in a high wind and beat itself to pieces; furthermore, that this would not happen had the cable been attached to the messenger strand by the use of cable straps instead of the spinner method. What is your opinion as to how plastic cable should be attached to a messenger strand?**

A. While it is true that high wind does cause trouble on light cable in some sections of the country, this is the first time that we have ever heard that the use of cable straps is to be recommended over the spinner method.

It is our opinion that the spinner method is just as safe as the straps. We have seen a lot of plastic cable attached to the messenger by the use of a spinner and we have not had any reports of trouble.

Also, self-supporting plastic cable is quite extensively used and we have not had any reports of it having caused trouble due to jumping in a high wind.

It is suggested that you observe your cable installation for a time before you attempt to make any changes in it. It is our belief that you will not experience any special trouble.

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**Q. When open wire lines are installed on the same pole line with high voltage power lines, what type of electrical protection is necessary?**

A. Special heavy duty arrestors should be installed on the telephone line to provide power cross protection.

This type protection provides a single assembly that can be used to serve five open wire circuits. It is easy to install on a crossarm by the use of three mounting screws.

The No. 10 copper wire coiled pigtails are precut to the proper length to reach all line wires. The unit is weather-proofed with an aluminum cover and sealed with rubber grommets. It is designed to provide an extended arcing period by means of heat-radiating fins and to prevent carbon breakdown by means of a light gauge self-destroying cover.

Each electrode is equipped with a fusible element which further reduces the impedance of the fault current path when the power cross continues over an extended period.

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**Q. Can you tell us whether there is any safe method to use when one man must hold a drill while another hits it with a sledge?**

A. There is a special tool available for this purpose. This device consists of an 18-inch handle made of tough steel tubing. A loop-like flexible grip on the end is tightened around the drill or chisel by merely turning the knurled handle. This arrangement keeps the holder's hands well away from the danger zone.

A small 6-inch handle that operates on the same principle is available for holding small chisels, star drills, punches, gouges, marking dies, etc. The loop on the end of the tool is designed to hold tools up to 1¼ inches in diameter.

•

**Q. We have two hard-of-hearing subscribers on our exchange. Is there any simple and inexpensive means whereby I may amplify the output of their receiver? I have been told that I may accomplish this by wiring a transistor in the circuit. If this is true will you please furnish complete information and circuit drawings?**

A. We suggest that you not attempt to construct a hard-of-hearing telephone locally. While this can be done, it is not a simple task, and in our opinion it would prove more economical to purchase these special sets from your telephone supply house.

Many hard-of-hearing people who wear a suitable hearing aid use the conventional type telephone without difficulty.

**Part 27 (Continued)**

## Reprint of "SOMEONE TO TALK TO"

**By Gretta Palmer**

Analysis of successful interviews with people who wished to "blow their tops" has shown that the listener always talks less than one-quarter of the time—sometimes very much less. His remarks never introduce a new idea into the conversation and never steer it in a different direction. But a listener may repeat, in other words, what the talker has already said. Sometimes he can sharpen the speaker's remarks and put them even more brutally, so that the talker realizes exactly what kind of things he has been saying. That slight exaggeration of what has been heard is as close as a good listener ever comes to directing the talker.

Take an example: A man has been pouring out a great deal of unintelligently bitter feeling about some group of people whom he dislikes. The "facts" he has presented are all absurdities that could be answered by other, sounder facts. But to answer them in this way would accomplish nothing. The man is expressing emotion and his emotion had better be allowed to show itself in all its ugliness. Then, the speaker himself will begin to see that he has gone too far.

An intelligent listener can help this process along in a gingerly and discreet way by throwing back at the speaker his more extreme remarks, so that he will himself see how unreasonable they are. "Then you'd really be happier if your wife were dead?" is such a shocker, which might be used if that is what the man's complaints of her have said. Or, "You'd like to have everybody who goes on strike put in jail?" is such a remark, and "You'd really rather see refugees die in Displaced Persons camps than let them into this country?" Such remarks are not made to win the talker to your own viewpoint; their only purpose is to let him see what he has actually said, so he can examine it and consider whether he likes to be the kind of person who can make such remarks.

(8) Listening, as you can see, is hard work. It demands a difficult kind of self-discipline if we wish to do it helpfully. And one of the hardest of all rules governing it is this: "Don't pass moral judgments." Your role in listening is not that of the



reformer—you are not attempting to make the speaker over into your own image.

The things that the talker is saying, no matter how hostile and unattractive they sound, are a part of the person you are trying to help. Perhaps he will never feel this way again as long as he lives. Perhaps you will be in quite as gloomy or angry a state of mind next month.

Better lay off the practice of throwing stones at the talker, even inside your secret thoughts.

The refusal to pass judgment applies to both sides of the case that you are hearing. You should not only avoid saying, "You're wrong," but if you are wise, you'll also refrain from saying, "The other person is wrong." . . .

(9) Even if the speaker asks you directly for your advice, you need not give it to him—and you will not, if you are honestly determined to help. The temptation to answer such questions with a sentence beginning, "If I were you," is strong. But remember, you aren't the speaker.

"No person is wise enough to advise on another person's problem," is one of the fundamentals taught to Harvard and Radcliffe students by experts in the field. The giving of advice, even when it has been requested, may also keep the man or woman in trouble from pushing on to a real solution of his own.

When a husband says, "Don't you think I'd be perfectly justified in quitting tomorrow?," there are a dozen things a wife will be tempted to say. Most of them will only add to his trouble. For the only answer that can help, in such a case, is the one that lets the husband decide the matter for himself.

A wise wife will simply repeat back to her husband what he has told her of how he sees the problem. She will say, "You feel you can't go on for another day?" or "You've definitely decided you want to quit?"

She will not smuggle into the conversation the question of what kind of job he could get in place of the old one or ask him how they are to live if he does not work. Those matters will come later, when the husband has talked out his present rage.

(10) The only remark worse than "I think you're absolutely wrong" is "I think you're absolutely right." Those in distress are not helped by judgment or approval of their angry states of mind.



Counselors are told, "We don't help people by wading into the same emotional puddle in which they find themselves." You don't cure a consumptive by contracting tuberculosis; you don't help a person in distress to get a burden off his chest by putting it on yours.

Those who have made listening their life work have found that one simple method of handling this difficulty is to identify themselves with the talker as he will be when the problem has been solved.

The temptation to become involved in his rage or his pain can be avoided if we think to ourselves, "After all this is out of the way, I want to talk to him about books or fishing trips or tell him that amusing story about Jim." The person with whom you wish to establish friendship is not the bewildered, sick-at-heart or angry talker of the moment, but the serene individual he will be when this is off his chest.

(11) Be genuinely interested and show it—good listening is impossible if your thoughts are wandering off to the planning of the next day's menus.

Actually, it has been found, the effort to be attentive is needed only in the first few moments of a conversation with someone who really wants to talk. You cannot long remain detached; you will find your spontaneous interest increasing as the interview goes on.

At the end, you may well discover that you have experienced as much relief from your tension and worries as the speaker has. The interview is a two-way street, with both of you involved.

But, because you are a human being and not an angel, your own emotions may be unpleasantly aroused during the course of the talk; something the speaker says may outrage you and make you indignant. Admit this to yourself and set the problem aside to be considered later, when you are alone. While you are listening, it is not your job to express your sentiments, however proper and superior to the speaker's you may consider them.

With this viewpoint in mind, you will find it possible, if not easy, to avoid the two worst sins a listener can commit: Interrupting and arguing. We interrupt only to "set people right," and we argue only when we are more concerned with the subject under discussion than with the feelings of the speaker on the other side.

*(Section 27 to be continued next week)*

*TROUBLE CLEARING*

# The Oscilloscope—How It Works

By L. N. MARTIN

THE OSCILLOSCOPE is an instrument by means of which the wave shape of an alternating current or voltage, or the wave shape of a varying direct current or voltage may be seen on a screen (much like the screen of a television set) and studied. It is not an instrument that a small telephone company should buy, as it would be rarely used.

However, all telephone companies should know what it is, how it works, and when it should be used. They can then obtain the instrument when it is required, or better still, obtain the service of an experienced engineer who has an oscilloscope and knows how to use it. A large telephone company should have at least one of these instruments in its chief engineer's office.

The oscilloscope looks much like one of the new portable (or personal) TV sets but is even smaller, having a 3 or 4-inch screen. It operates on much the same principle as the TV set, however, it was used by the telephone and other electrical industries many years before television was perfected.

Most telephone men have at least a general idea how a TV receiving set works. A stream of electrons or cathode rays is focused on a fluorescent screen where it forms a small bright dot. Electromagnets deflect this stream in such a way that it covers or "scans" the entire screen many times a second. The incoming signal from the TV broadcasting station controls the brightness of the dot so that as it scans the screen it "paints" a picture in various shades of light and dark.

The oscilloscope has a pear shaped tube much like the picture tube of a TV set. The large end is flattened and coated on the inside with a fluorescent material. The equipment for producing the stream of electrons is at the small end of the tube. A stream of electrons may be deflected by a magnetic field.

Two pairs of electromagnets are placed outside the tube. One pair controls the horizontal deflection and is energized by an oscillating tube which is so arranged that it produces a "saw tooth" wave form. This wave increases from zero to maximum then drops almost instantly to zero. This causes the dot to scan the screen from left to right then return almost instantly to the left. This produces a horizontal line (the zero line) across the screen.

**PART 54. The preceding article in this series appeared on page 21 of the Jan. 19 issue.**

The other pair of magnets controls the vertical deflection and they are connected to the current or voltage that is being tested. This causes the electron stream to swing up and down with the current like the needle of a galvanometer. Since it is also moving steadily to the right it draws a true picture of the wave form of the current.

It should be noted that this stream of electrons, unlike the needle of a galvanometer, has no weight, no inertia, and no friction. It therefore, accurately responds to any variation in the current, no matter how high the frequency.

The picture that appears on the screen looks very much like the drawings that we have used to illustrate our recent articles on wave shapes. If the current should be absolutely constant in frequency, wave shape, and amplitude it would produce a "still picture."

However, there is nearly always some variation from cycle to cycle in one or more of these factors so that the curve continually changes its form. It often appears to squirm or wriggle. The image will also drift to the right or left unless the frequency of scanning is adjusted so that it equals the frequency of the current or some multiple thereof.

The scanning speed is usually adjusted (by means of a dial) so that one or a few cycles appear in a stationary position on the screen.

Thus, by means of the oscilloscope we can see a living moving picture of the wave form of a current or voltage. If there are any irregularities, they are plainly visible. If the irregularities are transient, they will flash on the screen from time to time.

If the trouble is due to transients that occur at variable and infrequent intervals, it may be necessary to watch the screen for some time, but when the trouble appears, its nature and hence its probable causes can be ascertained.

There is a type of irregularity that we have not yet discussed in this series. It is called "Harmonics" and consists of higher frequencies superimposed on the fundamental frequency. These harmonics are always multiples of the fundamental frequency. Thus a 60-cycle current may contain some 120-cycle, 180-cycle, 240-cycle or 300-cycle.

Very few current supplies are entirely free of harmonics, just as in music there are very few pure tones. Fortunately, these harmonics are usually small in amplitude compared to the fundamental frequency, however, at times one of the harmonics may be quite large, say one-half the strength of the fundamental.

Harmonics are plainly visible on the screen of an oscilloscope, and their frequency and amplitude can be readily ascertained. If the harmonics are high in frequency, but small in amplitude, they appear as ripples on the otherwise smooth curve of the sine wave. Harmonics of large amplitude cause a very distorted wave shape as they go in and out of phase with the fundamental wave. However, the curve can be analyzed and the frequency and amplitude of the harmonic ascertained.

The higher the frequency of a current the more it tends to "crosstalk" to other circuits. Thus, a 60-cycle power line may not interfere with an adjacent telephone line. However, if the 60-cycle current is rich in the higher harmonics the interference may be quite serious. The oscilloscope will analyze this trouble and the power company may be able to correct the condition.

Ringing machines of the "pole changer" or "vibrating" type used in

small offices are notorious producers of harmonics. (This can sometimes be partially corrected by the use of filters.) Therefore, the output of these machines is often very noisy. They cause complaints when a subscriber gets rung in the ear and the ringing induction annoys subscribers who are talking on other lines.

We once studied the output of a 16⅔ cycle ringing machine with an oscilloscope. At irregular intervals this machine would put out a large 50-cycle harmonic. This accounted for the mysterious cross-ring complaints we had been receiving. Likewise the 33⅓ cycle generator would at times put out strong 66⅔ cycle waves.

Many who have visited the Bell telephone exhibit at a museum or exposition have seen an oscilloscope in operation without knowing what it was. A sign says: "*See* your own voice." The visitor speaks into a telephone handset and a curving bright line flashes on a fluorescent screen on the wall before him. The pattern constantly changes as he speaks, each word producing a different pattern. If he should whistle in the transmitter, an almost pure sine wave would appear on the screen.

While the oscilloscope so displayed is just a curiosity for the casual visitor, it also has a very practical use. The voice waves are very complex combinations of a large number of sine waves of different frequencies and amplitudes. While the wave seems very irregular, an engineer experienced in this work can break it down into its constituent sine waves and in some cases can even identify the word that has been spoken into the transmitter.

The engineers in the large telephone laboratories and the laboratories of companies that manufacture telephone equipment use this instrument to analyze voice waves so as to design transmission circuits and transmission equipment that will reproduce the voice with high fidelity. While a small telephone company would have no occasion to undertake work of this kind, this should be of interest to all in the telephone business.

Sometimes a permanent record of a wave form is desired. An oscillograph is used for this purpose. In this instrument, the moving stream of electrons is focused on a moving ribbon of photographic film which when developed is a permanent record of the wave shape. We have not found any practical use for the oscillograph in telephone exchange work but, on several occasions, we have found the oscilloscope very useful.

## Get In The Clear

**By JOHN A. BRACKEN**

**From the standpoint of safety in performing telephone outside plant construction work, the command *"Get in the clear,"* is of paramount importance. It simply means, get out of the way of anything that might hurt you as quickly as possible.**

**Consequently, when a construction crew member hears someone shout, *"Get in the clear,"* he should act instantly. If unable to do so, he should at once make the fact known in a good loud voice. It is much better for one to yell before being hurt than for someone else to have to call an ambulance afterwards.**

### *Additional Information on Impedance Chart*

In our article which appeared on page 46 of the Dec. 1, 1956 issue of TELEPHONY we described a chart for finding the impedance and its angle when the resistance and reactance are known, without the use of trigonometry, or other mathematics.

We have had some favorable comment on this chart, but some readers are having difficulty in preparing the chart due to the fine detail and accuracy required. Perhaps we should have explained this more fully in our article.

In this chart, the smallest division must be as small as 1 millimeter. Now 1 mm is very small spacing (about 1/32 inch) and it would indeed be a good draftsman who could draw a thousand or more such lines with accuracy. In preparing this chart, you must start with prepared cross-sectioned paper with the finest lines 1 mm apart in both directions.

The chart itself is 5 decimeters square and, with its margins, requires a sheet about 6 dm square. Special ruling machines are used by the producers of such paper and the lines are very uniform and accurate. The paper used in preparing the chart that we are using has heavier lines at 1 centimeter intervals and still heavier lines at 5-cm intervals.

The draftsman completed the R and X scales by numbering the 5-cm lines from 0 to 10 both horizontally and vertically. These numbers represent the first digit in a three-digit number. He then numbered the four 1-cm lines that are between each two 5-cm lines: "2 4 6 8." These figures indicate the second digit in a three-digit number. Each 1 mm space then represents 2 in the third-digit position.

Since it is easy to estimate the center of a 1 mm space, any three-digit number may be accurately spotted on these scales. It was not necessary for the draftsman to draw any additional vertical or horizontal lines.

The radii which measure the angle are easily drawn by the use of a protractor which may be read in degrees. The radii are drawn at 1-degree intervals with heavier lines at 5-degree intervals. However, as these lines approach zero they would become too congested, therefore, between 0.2 and 2.0 on the Z scale, the 5-degree lines only are drawn and these lines end at 0.2 instead of continuing to zero.

The arcs which form the Z scale may be a problem as it would require an unusually large compass to draw them. However, a resourceful draftsman should be able to devise a gadget for drawing these large arcs. Heavy lines are drawn at 5-cm intervals and lighter lines at 1-cm intervals. The draftsman will, of course, not attempt to draw arcs at 1-mm intervals.

If an accurate third-digit reading is required, the space between the two 1-cm lines may be measured with a metric ruler that is graduated in millimeters. Such a ruler may be made by cutting a strip from the cross-sectioned paper that was used for the chart and gluing it on an ordinary ruler that is scaled in inches.

This reminds us that a metric ruler (preferably 1 meter long) is an excellent instrument for laying off lines whose lengths represent abstract numbers. Thus, the number 354 may be represented by 3 dm, plus 5 cm, plus 4 mm. If an engineer has a drafting board and the usual drafting instruments, plus a metric ruler at hand, he can solve any problem involving a triangle to three-place accuracy in less time than would be required to look up the functions in a table and make the necessary computations.

We hope that the foregoing will be helpful to those who are trying to follow out the ideas suggested in our December 1 article.



XUM

# Fire Destroys Central Office; Mobile Unit Fills Emergency

By HAROLD B. McKAY

ON SUNDAY evening, Nov. 24, a customer in the Flanders 5 exchange near San Francisco, Cal., took his handset from its cradle. The results were immediate and spectacular. Instead of dial tone, he got a dull boom as part of the roof blew off the central office. Gas from a leaking pipe had seeped through the telephone cable ducts and accumulated in the unattended step-by-step office.

When a spark from a switch ignited the gas, telephone service for 2,000 customers was gone in a matter of minutes. First firemen to arrive at the scene said the gas was still burning; a huge orange fireball covered the entire ceiling of the building and a jet of flame roared out through the ruptured roof. Overhead cable runs between the distributing frame and the switches crackled into flame, then sagged and melted, dropping big plops of hot metal onto the floor.

The firemen entered and whatever equipment the flames did not consume, the water ruined. The first telephone men to get there found the office a total loss, yet in traditional fashion managed to get a couple of telephones working in the gutted building out of the PLaza exchange, a few miles to the north. This was done while the building was still smoky, and while a couple of inches of water still covered the floor.

Restoration measures were started at once, but a 2,000-line office cannot be replaced overnight. However, a manual PBX board was procured and set up in a store a block from the office and connected to a toll cable in a nearby manhole. The first lines were working to police and fire departments and other vital services by Monday morning.

The work of the plant department in times of disaster is always spectacular. There is something dramatic about the splicer and his roaring furnace near a lonely manhole in the middle of the night; the linemen and installers stringing spans of wire from poles, timbers, and roof-tops; the switchboardmen working around the clock, bleary-eyed, their numbed fingers putting wires together with quiet intensity —the convergence of trucks, jeeps, and vehicles of all kinds bearing a wide assortment of materials.

Less spectacular but just as urgent is the work of traffic, commercial, and the administrative forces. First, manual switchboards had to be found. An emergency trailer-mounted five-position board was kept in Los Angeles, 400 miles away. In the middle of the night, management personnel returned to their posts; and soon the emergency trailer was on the highway headed for San Francisco; and by Monday night was on location, already being hooked up.

Somebody remembered that an office in St. Helena, Calif., was to be cut to automatic in another two weeks. The date was moved up and the cut-over made at once. The old manual board was hoisted onto a truck and was soon on its way. An emergency building crew built a new frame building on the rear of the lot behind the damaged office so that when the switchboard arrived, men were waiting to connect it up.

### *Automatic to Manual*

Probably, most big companies have plenty of people experienced in the matter of changing a manual exchange over to an automatic basis. This job called for just the reverse, and this fact presented many interesting problems which had to be solved by engineers on the spot. First, the manual board from St. Helena would handle only 1,200 lines, and 2,000 customers were out of service. These lines had to be regrouped on a party line basis in order to get them onto the 1,200 jacks on the board. This necessitated the use of party letters and jack per line operation. This meant training not only customers, but it meant finding operators old enough to remember how this type of switchboard operates. ("There still is a use for grey hairs in this business" a traffic man observed.)

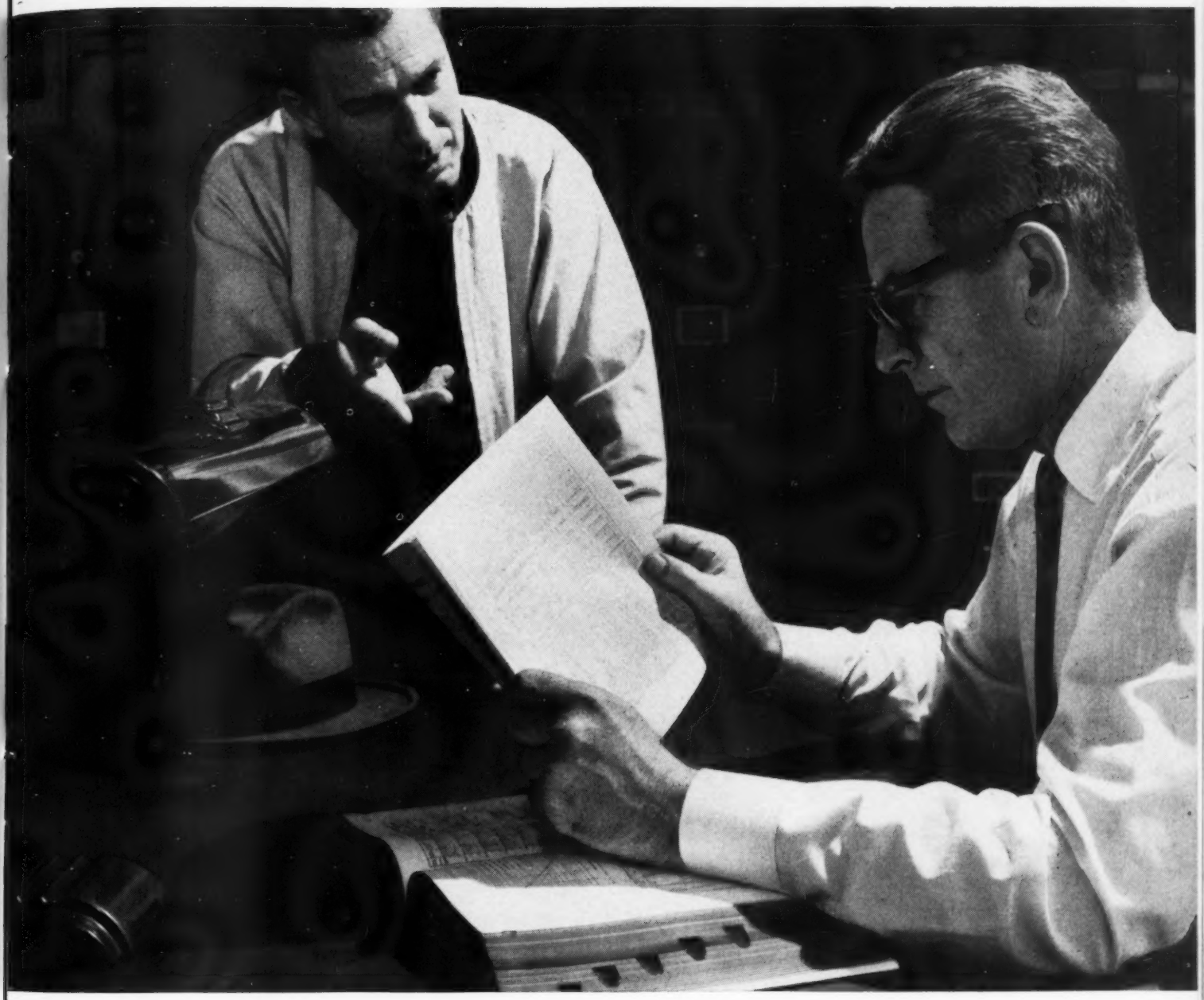
Old-timers were located and brought in from hundreds of miles away ready to operate the board as soon as it was connected up. This brought the problem of housing and feeding these people, providing them with rest periods and facilities and other little details that only traffic people would think of. The commercial people had to get out a new telephone directory and instruct and assist customers.

Before the St. Helena board was in operation many items of customer service had to be taken care of. First, the town of Sharp Park, where the fire occurred, depends upon the telephone system for fire and police protection. Both fire department and telephone people cooperated to provide emergency patrols during the period telephone service was out.

Telephone company radio equipped cars and fire department people with

*(Please turn to page 34)*

**When the Sharp Park, Cal., telephone exchange was destroyed by fire, temporary service was established in a few hours by means of mobile equipment housed in vans and trailers.—Photo by Louis Landman**



*Steve's writing new pole specifications because...*

# PENTA-treated poles last longer, handle easier

As construction and maintenance superintendent, I'm plenty interested in knowing that we're using the best materials we can get. Saves me trouble in installation and maintenance. That's why I went in and asked Steve —he's our specification engineer—how the specs on the PENTA-treated poles were coming along.

Steve said the specifications were in the works but he wanted to know two things—why should we change at all, and why the hurry.

That was my opening. I told him about PENTA's proven long life, the better public relations, the no extra cost, the ready availability and all the other improvements. And I pointed out that most joint-use poles were PENTA-treated and that utilities installed nearly 1½ million PENTA-treated poles last year. Then Steve broke in. He said he knew all that, but why was I so enthused about PENTA as a wood preservative.

So I confessed that it was really the men in the line crews I was thinking about. They want PENTA-treated poles now, because they are much cleaner and easier to handle. Well, we're getting the specs all right and we'll be using PENTA-treated poles in our new line.

THE DOW CHEMICAL COMPANY, Midland, Michigan, Department PE 984C-2.

YOU CAN DEPEND ON DOW

Max E. Wettstein has been President and General Manager of the Florida Telephone Corporation since 1953. His 25 years of active service with the Company in varying capacities makes him well qualified to serve as its chief executive officer. Mr. Wettstein's thoughts about Graybar are presented below.

# "We have always valued highly our relationship with Graybar"

The growth of the Florida Telephone Corporation in the past ten years has been extensive. Total telephones in service have increased from about 9,000 to nearly 30,000 and now, a continuing major project is even greater expansion to keep up with subscriber needs in this fast-growing State.

Concerning Graybar — Max E. Wettstein, President and General Manager of the Florida Telephone Corporation, says:

**"Graybar has furnished us with line supplies, telephone instruments, cable and all of the various and sundry items comprising basic telephone plant for a long period of years.**

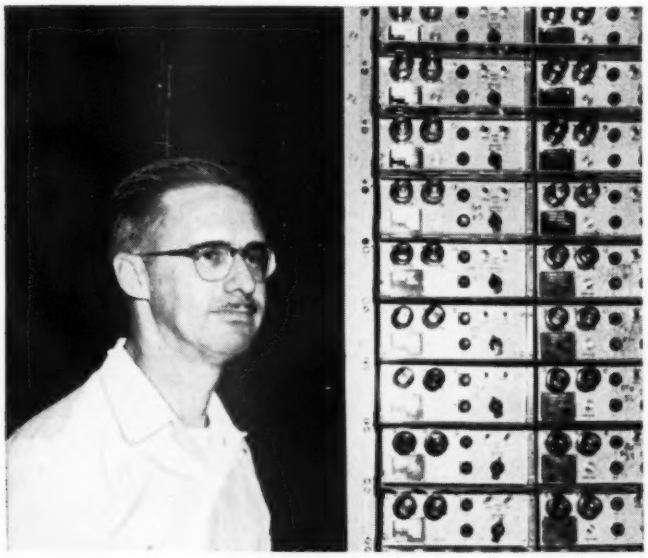
**"Throughout these years, we have experienced excellent Graybar service and have enjoyed the use of their quality products. Graybar has given us a specialized service through their experienced local representatives and nearby warehouse facilities which we feel is unsurpassed. In normal operations and in the many instances involving special treatment of urgent orders, Graybar has always come through to our complete satisfaction.**

**"We have always valued highly the fine relationship which Graybar and Florida Telephone have had with each other".**

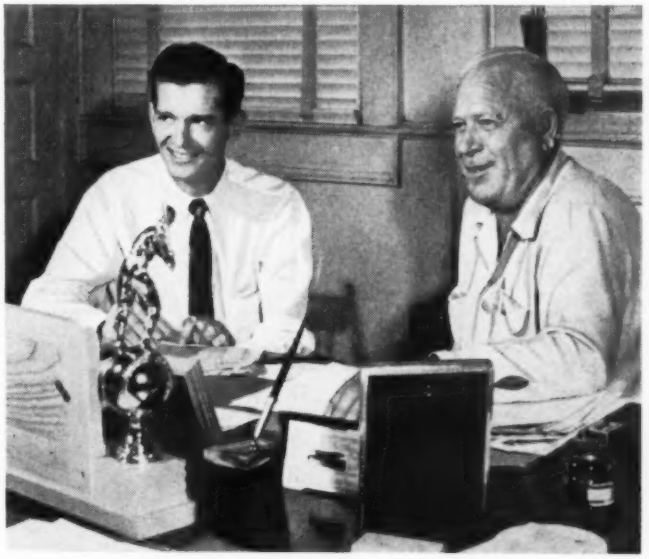
Thanks, Mr. Wettstein—we feel the same. And that's the way we operate throughout the United States, too. Many independent telephone companies rely on Graybar's warehouse system to carry their inventory. Pole line supplies for maintenance and new construction . . . central office equipment . . . subscriber carrier and toll circuit carrier . . . linemen's tools and safety equipment — all are conveniently available from Graybar located nearby. You too can benefit from Graybar's services. Call us for any telephone need. Like you, we are proud of our independent status. Graybar is owned solely by its operating and retired employees.

New Lynch B112 repeater installation is inspected by R. D. Eshbaugh, Chief Equipment and Building Engineer, and W. C. "Spec" Winfree, Graybar Manager of Communication Sales (pointing). The Florida Telephone Company now operates 18 exchanges and 5 subexchanges in eight counties in Central Florida. An accelerated expansion and improvement program will soon see its five remaining manual exchanges converted to dial operation.

Progress of a construction crew building additional rural lines is checked by Ralph Oswald, Plant Engineer, and Charles Whitaker, Line Foreman (left and right background). For both new construction and everyday maintenance, Florida Telephone management recognizes the importance of quality tools and supplies that their line crews know and respect and which are quickly available from Graybar.



H. G. Williams, Equipment Maintenance man, stands before the Lynch B112 repeater bay in the Winter Garden Toll Center and Exchange Building which was constructed in 1954. These repeaters are used with a new cable recently installed between Apopka and Winter Garden to expand facilities to the Winter Garden Toll Center.



Here Graybar Salesman John Coleman and General Plant Supervisor and Purchasing Agent John Riggs, at right, interrupt their discussion of a list of telephone supplies ordered from Graybar to smile for the camera. Graybar's specialized services and experienced personnel have done much to cement the healthy relationship between it and the Florida Telephone Corporation.

814-23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New York 17, N. Y.

Graybar QUALITY *Everything Electrical*

IN OVER 130 PRINCIPAL CITIES

walkie-talkie radios maintained a watch day and night until telephones were working again. A messenger service was established soon after the fire, whereby calls received on the temporary switchboard were completed by sending a car after the customer and bringing him to the emergency headquarters.

Full service on a manual basis was established within seven days after the fire. It will probably be several months before the automatic exchange is restored.

# IN THE NATION'S CAPITAL

*Continued from page 21*

service. The commission's opinion stated on this point:

"Our conclusion on this issue is that we cannot say with certainty that Pacific's activities in the private mobile telephone field do not delay, to some extent, the fulfillment of the public's request for new telephone service or upgrading of service. The primary obligation of The Pacific Telephone & Telegraph Co. is the provision of basic exchange and toll telephone service in the territory in which Pacific furnishes that service as a monopoly. While we are impressed with the importance of private mobile communication service to the public, a substantial portion of the public may obtain such service from organizations other than Pacific. In the territory served by Pacific, basic telephone service can be obtained from no other source. Considering all the circumstances, we are nevertheless of the opinion that no restrictions other than those herein provided should be placed on the offering of private mobile service at the present time."

Pacific's estimated operating results under the proposed rates indicated a rate of return of 6.8 per cent. This was disputed by the commission's staff on grounds that the proposed revenues did not cover all the expenses which should be properly allocated to the proposed service. The staff thought that the proposed rates would yield a deficit, or red figure, return of *minus* 3 per cent. The commission did not seem to be much impressed by this argument, although it thought that the telephone company's showing was more convincing than that of the staff. The commission pointed out that the service was more or less experimental and that it was in a position, by checking required records, to see that rates were compensatory in the future. Until that time, it did not feel that the commission should require a utility to charge a higher rate than what was necessary in the utility's own judgment.

### *FCC Describes Microwave*

A very interesting release by the Federal Communications Commission late last month describes what is rapidly becoming one of the nation's most useful communication mediums—microwave. FCC calls it the "new work horse." In addition to furnishing links in the national telephone and telegraph systems, microwave is now employed by broadcasters and others to relay television programs, by public agencies to protect life and property, and for a widening variety of industrial and other business purposes. The interests which seek to use microwave have become so extensive that the commission must re-examine operating policies in the light of rapid development of apparatus and techniques.

The FCC defines microwave as any radio communications service which uses very short waves—12 inches or less. Hence the name "microwave" because micro is the Greek word for "short." They have many characteristics of actual waves of light, according to the FCC release. The most notable of these is the fact that their workable range is usually within the "line of sight"—or the orbit limits of the horizon of a person able to use normal vision. This, of course, varies with elevation. You can see farther from the top of a skyscraper; and you can also send (or "beam") microwaves further from that position.

Microwaves also have some advantages over light waves, in that they can be directed to any selected spot without interfering with or being received outside of that pathway or beam. And, of course, they are invisible and are not affected by weather or man-made interference to the extent that longer ranged radio waves are. Furthermore, by methods known as "multiplexing" many messages or functions can be handled at the same time over the same microwave channel.

All this is "old hat," of course, to every technical man in the telephone business and a good many who do not go in for the technical aspects, particularly. They may be interested, however, because of the official nature of the source (FCC) in the following brief description of microwave operations in the telephone-telegraph field:

"Common carrier use of microwaves has become commonplace. Microwave links constitute about half of the Bell System's national coaxial-cable-microwave network. In addition to relaying TV programs, the Bell System can carry up to 600 two-way telephone conversations at the same time on a pair of microwave channels.

"The commission has also authorized some non-telephone company microwave systems, usually in isolated places, to pick up and relay TV programs to particular TV broadcast stations or community TV antenna systems on a common carrier basis.

"Since 1948, The Western Union Telegraph Co. has had a microwave system connecting New York, Philadelphia, Washington, and Pittsburgh, which it now plans to extend to Columbus, Cincinnati, Indianapolis, and Chicago.

"Common carrier microwave operation generally is provided in the region of 890-7200 megacycles. . . .

"Many (other) public utilities—such as power systems and oil and gas pipelines—depend upon microwave to control installations along the way. Pipelines constitute about two-thirds of the present route mileage of all private microwave systems, and power utilities about one-fourth. One petroleum chain extends from Texas to New York, a distance of 1,700 miles. Some other systems are more than a thousand miles in length.

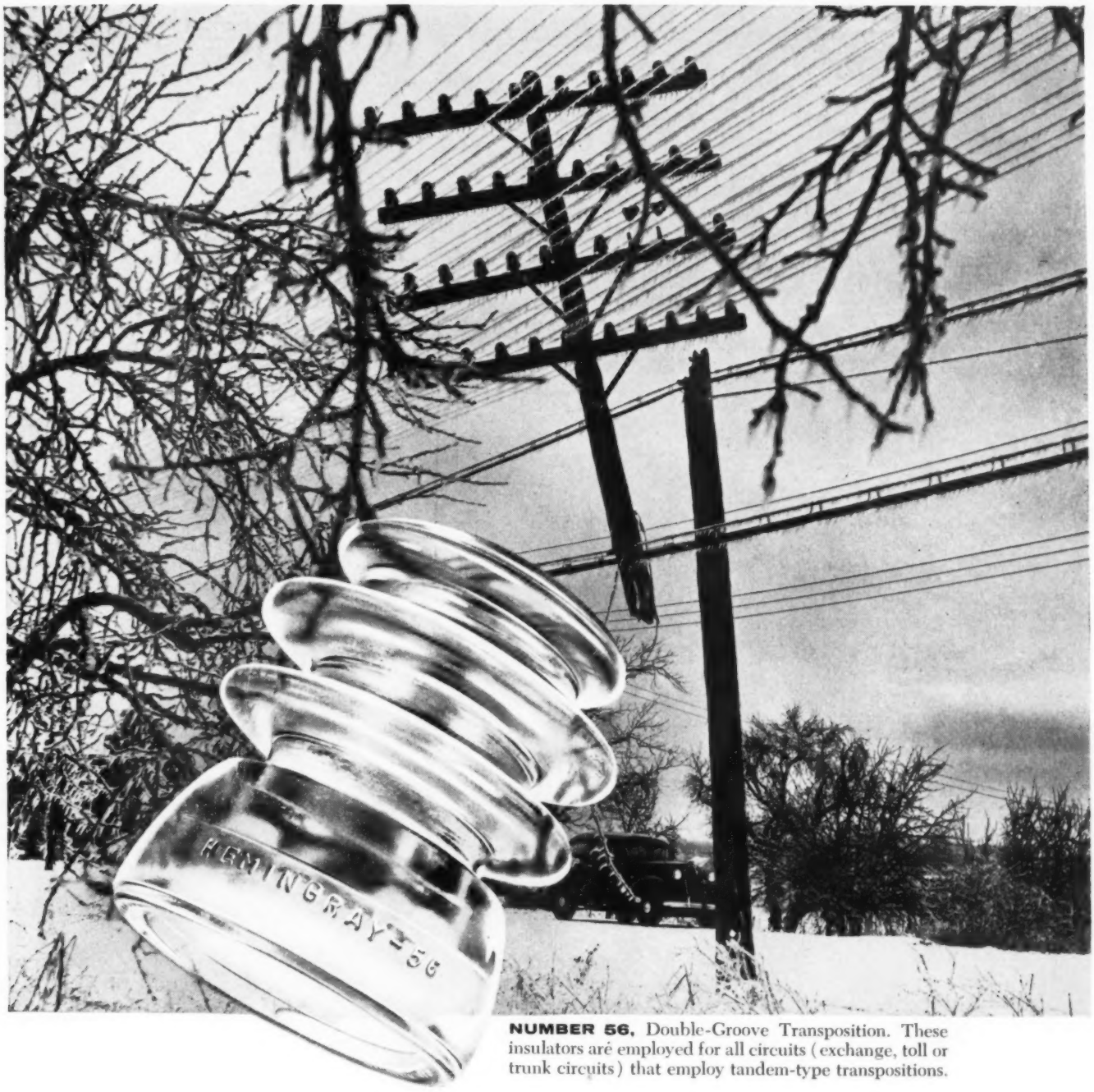
"In addition to using other forms of electrical communication, railroads employ microwave for signaling and other traffic controls. Radar operation on land and water also involves some incidental microwave utilization. Some private microwave systems provide more than 100 channels for voice communication.

"Present private microwave operation is mostly in the 2000-6000 megacycle range."

When we add to this other specialized uses of microwave point-to-point, such as federal, state, county, and municipal governments, we can see what is FCC's real problem in this field. It is its familiar old headache of allocating the radio frequencies between rival claimants, and occupying the role of traffic policeman of the air waves. But like automobile traffic, today, as compared with 20 years ago, the radio traffic puzzle is much more complicated and growing more so.

The conflicting claims of various parties, including telephone companies, for the exclusive right to this or that band of frequencies will require careful sifting, engineering appraisal, examination of economic evidence, and other pertinent factors. And, when all that is done, and all the arguments heard, and all the briefs filed in the forthcoming proceedings before the FCC, final decision as far as telephone companies are concerned may well rest upon a paramount consideration of regulatory policy. This policy involves the duty of the FCC to conserve the radio spectrum from unnecessary exploitation, and to preserve its maximum utilization in the public interest. Heretofore, that basic policy has always been reflected in an FCC tendency to exclude from the air waves commercially specialized communications traffic which could be just as easily and efficiently handled by alternative (non-radio) means of communications.

*(Please turn to page 40)*




**NUMBER 56,** Double-Groove Transposition. These insulators are employed for all circuits (exchange, toll or trunk circuits) that employ tandem-type transpositions.

# Dependable ...in emergencies

When they're on the line, you can *depend* on their strength and uniform high quality.

When you order you can *depend* on prompt deliveries of what you need . . . when you need it.

Since 1870, when Robert Hemingray began mass production of screw-thread insulators, Hemingray has pioneered most of the insulator developments to keep pace with the requirements of the communication systems of the world.

Today, as always, Hemingrays are world standard for quality, and most of the overhead telegraph and telephone lines of the world are carried on *dependable* Hemingray Glass insulators. They are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

HEMINGRAY INSULATORS
AN (O) PRODUCT

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**MISTER...**

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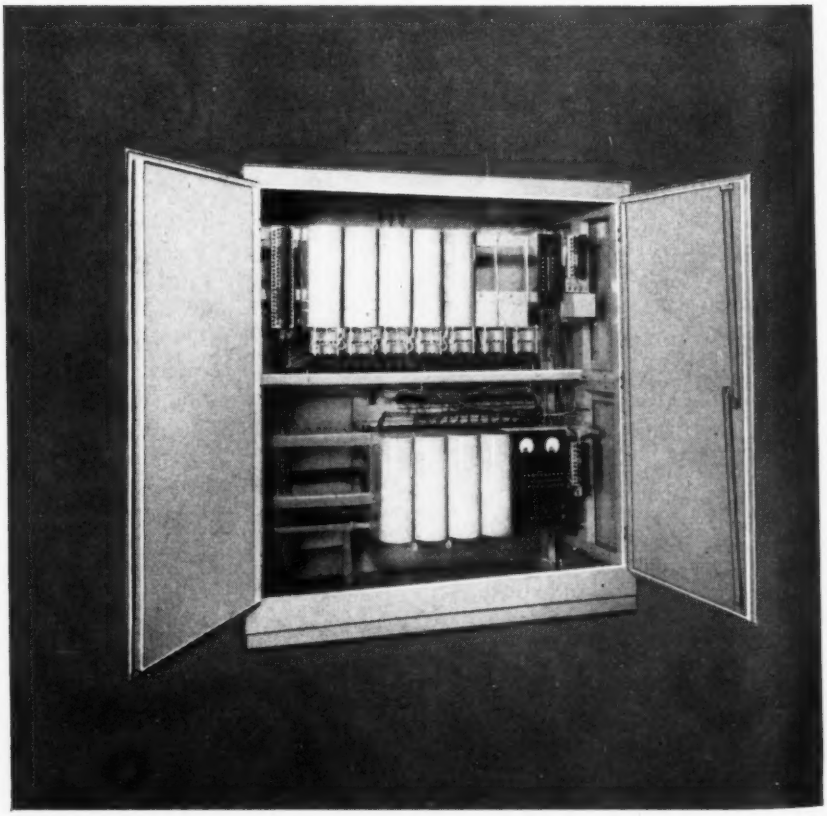
serving up to
50 lines
at a...



# ..LOW PRICE...

lower, even, than some competitive 40-line boards, and that you get...

# FAST DELIVERY!

because it's available from stock? You didn't? Well—read on!

## FACTS FOR THE FACTUAL-MINDED

• Automatic's new Type 25B P-A-B-X meets today's most popular service demand—25 to 50 telephones, 7 trunks, 10 links—and can expand beyond 50 stations if necessary. Convenient cordless attendant cabinet.

• Type 25B provides these standard modern services

—Group Hunting (calls automatically routed to an idle telephone in a group)

—"Meet me" Conference Service

• All these optional services, too!

| | |
|---|---|
| Attendant Priority Service | PA Cut-in |
| Executive Key-calling | Code Call |
| Executive Direct-line | Night Transfer |
| Executive Right-of-way | Call Forwarding |
| Direct Line Service | Tie Lines |
| Secretary Answering | "Progressive Selection" Conference Service |
| Area Paging | "Fixed Group" Conference Service |

Your P-A-B-X business future will be even rosier with Automatic's new Type 25B. It's just the size most of your customers need—and it's priced right.

We'll be happy to send you full details. Ask for new Circular 1815-A. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

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ORIGINATORS OF THE DIAL TELEPHONE

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# Courts and Commissions

## Krueger Named Chairman Of Ohio Commission

Everett H. Krueger Jr. was named as chairman of the Ohio Public Utilities Commission by Governor C. William O'Neill, starting Feb. 1 for a six-year term. He will succeed Robert L. Moulton of Galion, O.

Mr. Krueger was former first assistant attorney general and for two and one half years the commission's chief counsel.

Krueger's appointment will return the commission to Republican control. Moulton is a Democrat.

Krueger is a native of Cleveland, and his father, Everett H. Krueger Sr. was a previous utility director of the city of Cleveland.

Other commission members are Ralph A. Winter of Lodi, a Republican, and Edward J. Kenealy, of Cleveland, a Democrat.

## CWA Pays Southern Bell For 1955 Strike Damages

The Communications Workers of America (CIO-AFL) has paid Southern Bell Telephone & Telegraph Co. $315,000—the largest such payment in the history of the telephone industry—for physical damages inflicted on the company's facilities during the 1955 strike, it was reported on Feb. 7.

Payment by the union was the outgrowth of a damage suit filed in 1955 by the company. After the agreement to pay was reached in Nashville, Tenn., by Southern Bell and CWA attorneys, the court ordered the suit dismissed on Feb. 7.

In the suit filed May 31, 1955, in the Davidson County, Tenn., (Nashville) circuit court, Southern Bell charged the union with "a pattern of violence" designed to destroy telephone facilities and interfere with communication service in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee.

The suit, seeking 5 million dollars for punitive as well as actual damages, alleged that the union, its members and others joined an "unlawful combination and conspiracy" to damage property. The suit said the union "embarked on a program of wanton, willful and malicious misconduct and property damage," including the use of dynamite, firearms and cable cutting.

The National Labor Relations Board at Washington recently issued an order prohibiting the CWA from engaging in illegal strike practices against Southern Bell. The charges included mass picketing, coercion of employes and acts and threats of violence to persons and property during the 1955 strike.

This was the second such payment by the CWA to a Bell company. In 1954, the CWA-CIO paid the Chesapeake & Potomac Telephone Co. of West Virginia $75,000 in an out-of-court settlement in which the company charged "belligerent, disorderly" mass picketing, brutal assaults upon employes and threats of bodily violence and blockades.

## OK N. C. Company Sale of 44,615 Shares of Common

The Western Carolina Telephone Co. recently was authorized by the North Carolina Utilities Commission to sell 44,615 shares of its $5.00 par value common stock at not less than $6.00 per share.

Funds raised from the sale of stock will be used for expansion purposes.

Under the commission order the stock will be offered first to present stockholders at the rate of one share for each share held. Stock remaining will be sold to the public.

## Two Illinois Companies Ask Authority to Purchase

Champaign County Telephone Co. has asked Illinois Commerce Commission authority to purchase the North Harwood Telephone Co., the commission said on Jan. 25.

Similar authority was asked by Inland Telephone Co. to purchase plant, system and facilities from James L. Capel at Towanda.

## S. D. Senate Gets Bill on Misuse of Party Line

South Dakota's House of Representatives passed on Feb. 1 and sent to the state senate, a bill which would make it a misdemeanor not to surrender a party line in an emergency.

The measure would set a maximum penalty of six months in jail and a $500 fine for violation. The same penalty would be imposed for claiming an emergency falsely to get on the line.

## Virginia Independent Seeks 6.08% Return

An application requesting increased rates was filed on Feb. 6 by the Tidewater Telephone Co., Warsaw, with the Virginia Corporation Commission.

The new schedule would provide $160,534 in additional revenues as well as a return of 6.08 per cent on the company's investment, a spokesman said. He stated the present rate of return is 4.81 per cent.

Rodney M. Coggin, company president, said the present rate of return is not sufficient to attract the additional capital needed to carry out the capital expenditure budget adopted for 1957 amounting to $1,145,860.

## Ohio Commission Hears Rate, Sale, Financing Pleas

Recent Ohio Public Utilities Commission action has been reported by TELEPHONY'S Ohio correspondent as follows:

The Lorain (O.) Telephone Co. received recent approval from the commission to issue and sell for cash, to the residents of the state of Ohio only, 1,000 shares of its 5 per cent preferred stock at a price of $102 per share, aggregating $102,000, all proceeds of which are to be used to reimburse the company's treasury for capital expenditures.

*

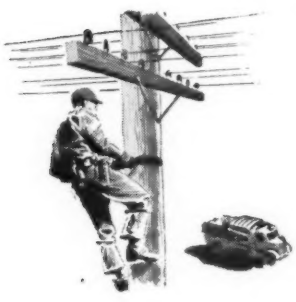
The Ohio commission on Jan. 31 dismissed a complaint involving a substantial portion of the Montrose ex-

***The world of science behind***
**EXIDE-MANCHEX BATTERIES**

*Being interviewed is R. R. Jardine, Supervisor of Development Engineering*

## *"Open windows let electrolyte in—power out"*

*At the Exide Laboratories*—**Reporter:** You mean there's an important connection between the electrolyte and the battery power?



**Jardine:** Yes indeed. You see how I'm running these strings through the "windows" in the Exide-Manchex positive plate? These openings give the electrolyte free access deep into the interior of the plate.

**Reporter:** How does that affect battery performance?

**Jardine:** It means there's no time lag—no slow filtering of the electrolyte to reach the active material. There's a continuous contact between the electrolyte and the entire plate. So the power is there when it's called for.

**Reporter:** Do other batteries have this free access of electrolyte to the active material?

**Jardine:** No they don't. Because only the Exide-Manchex has the positive plate with the spiral lead buttons locked into a cast alloy grid.

**Reporter:** Obviously this is an important feature of the Exide-Manchex Battery.

**Jardine:** Yes it is, but it's just one of many engineering details that contribute to their long life and high capacity.

**Note to battery users:** When you order batteries for float or cycle service in stationary applications, be sure to specify Exide-Manchex. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Co., Philadelphia 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY Exide®

change subscribers of The Ohio Bell Telephone Co. and concerning their dissent from the message-unit rate treatment for various calling areas.

The examiner hearing this case, in his report to the commission, stated that if the multi-party message treatment involved in this particular complaint were eliminated, the flat rate charge of all telephone subscribers in the Cleveland metropolitan area would have to be increased.

The commission took exception to this part of the examiner's report. It raised a question as to why the rates of all Cleveland metropolitan area subscribers would have to be raised were the message-unit charges of the Montrose exchange eliminated. The commission stated this point could not be determined in the proceeding but of necessity would have to be resolved by consideration of the over-all return which the company is earning on its operation system-wide.

The commission dismissed the case.

*

The Northwest Telephone Service Co. of Wauseon, serving approximately 20 exchanges in the northwest part of Ohio, has made application to the commission for an increase in rates.

*

The Paulding Telephone Co. has been authorized to purchase the Cecil Mutual Telephone Association, which serves approximately 150 subscribers.

The Paulding company intends to install automatic equipment and to effect additional extended area service between the Cecil and Paulding exchanges.

*

The Geneva Telephone Co. was granted an increase in rates by the commission on Jan. 30. In order to minimize rate case expense (an expense eventually passed on to customers) the company requested the commission, and the commission agreed, to determine a rate base derived by adjusting a former valuation at 1951 price levels for net additions made since that valuation up to the date in the present case (Dec. 31, 1955). The rate base thus found is $1,863,223.

The rate of return which the company sought was 5.15 per cent and the commission found that such a return "falls within the band of reasonableness for determination of the fair return."

Application of a 5.15 per cent rate of return to the rate base of $1,863,223 produces a return of $95,980. The commission found the company's expenses for the test period to be $416,549 and when this amount is added to the return, this results in allowable gross revenues of $512,529.

The commission stated the company's present gross revenues are $463,762, the expenses applicable thereto are $390,806, thereby leaving a return of $72,956 which is a rate of return of 3.91 per cent on the rate base.

The difference between the allowable gross revenues and the gross revenues at present rates and charges is $48,767 which represents the amount by which the commission has authorized the company to increase its rates and charges.

The new rates authorized by the commission are:

| | *Business* | *Residence* |
|---|---|---|
| One-party | $8.25 | $6.25 |
| Two-party | 7.00 | 4.50 |
| Five-party | 5.75 | 3.25 |
| Ten-party | 5.00 | 3.25 |

*

## Ohio Company Registers 15,000 Shares Preferred

Elyria (O.) Telephone Co., put 15,000 shares of cumulative $50 par convertible preferred stock into registration with the Securities and Exchange Commission, it was reported on Feb. 4.

The preferred will be offered publicly through an underwriting group headed by Kidder Peabody & Co. At the same time, Elyria said, it will sell 1¼ million dollars of 4¾ per cent first mortgage bonds, series B, due 1987, to an institutional investor at par.

Proceeds of the sale of the preferred stock and bonds, the company said, will be used to repay 1¾ million dollars of short-term bank loans incurred in its construction program and to finance more expansion.

## Kan. Commission OKs Rates; To Hear Sale Request

The Kansas Corporation Commission announced recently that the Palco Telephone Co. is to apply for permission to sell its properties to the Rural Telephone Service Co., Inc. of Lenora.

The commission recently approved a rate increase in all classes of service by Manchester Telephone Co., which serves 108 customers.

## Missouri Commission OKs Revision in Rates

The Missouri Public Service Commission the week of Jan. 20 authorized the Fidelity Telephone Co., Sullivan, to file revised rates that would increase revenue $31,300.

The company stated that a recent conversion to automatic operation in all of its exchanges except Sullivan had added to its financial burden. The company serves Sullivan, Owensville, New Haven and Stanton.

At a hearing before the commission on Dec. 11, Clifford Davis, president and owner, had asked that the company be permitted to make rate revisions that will assure it $61,000 more gross income a year. The commission authorization is about 50 per cent of the increase asked.

# IN THE NATION'S CAPITAL

*Concluded from page 34*

Telephone companies, of course, provide a commission regulated medium, open completely to public service and making maximum use of any radio frequencies assigned to it. On the other hand, permitting a highly specialized commercial interest to grab off important radio frequencies for its own business use, is somewhat similar to allowing unsightly billboards and hot dog stands to clutter up newly opened parkways of public communication — parkways which should be reserved for the use of all. The FCC release puts this very discreetly as follows:

"In the present stage of development, all of the private microwave systems, except those of TV broadcasters, are licensed on an experimental or developmental basis. Now that apparatus and methods have improved, and practical operation has been demonstrated, the commission is considering the possibility of placing many of the noncommon carrier microwave services on a regular basis.

"However, various considerations are involved—such as present and future needs for microwave communication; the availability of channels to meet these needs and, if insufficient, who shall have prior rights in congested areas; and how to deal with interference which may be created by many microwave systems operating in, or converging upon, a single large metropolitan area. Also, the question as to whether, and under what conditions, private microwave systems shall be permitted to duplicate or parallel those of common carriers needs to be settled in an equitable manner, and in a way which will best serve the public interest."

The forthcoming hearings of the FCC on the allocation of ultrahigh-frequencies above 890-940 megacycles may well provide a forum for full discussion, if not final decision, of these important policy matters. Furthermore, the showdown will probably be next Spring.

## OK Western L&T Stock

Western Light & Telephone Co., Great Bend, on Jan. 23 secured Kansas Corporation Commission authority to sell 65,568 shares of $25 par convertible preferred stock which will carry interest of 5.2 per cent.



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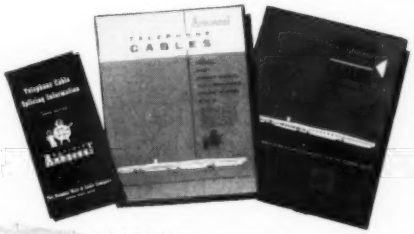
# Get The Cable You Want When You Want It From The Big, New Ansonia Plant

ANSONIA®
# Ankoseal

Ansonia Ankoseal Cables, produced in the most modern plant in the industry devoted entirely to plastic cables, are offering the finest transmission characteristics ever provided in plastic telephone cables.

Get the full advantages of the most experienced maker of plastic telephone cables...get Ankoseal Cables.

Ask for the latest Ankoseal literature including a new pocket size splicing booklet.

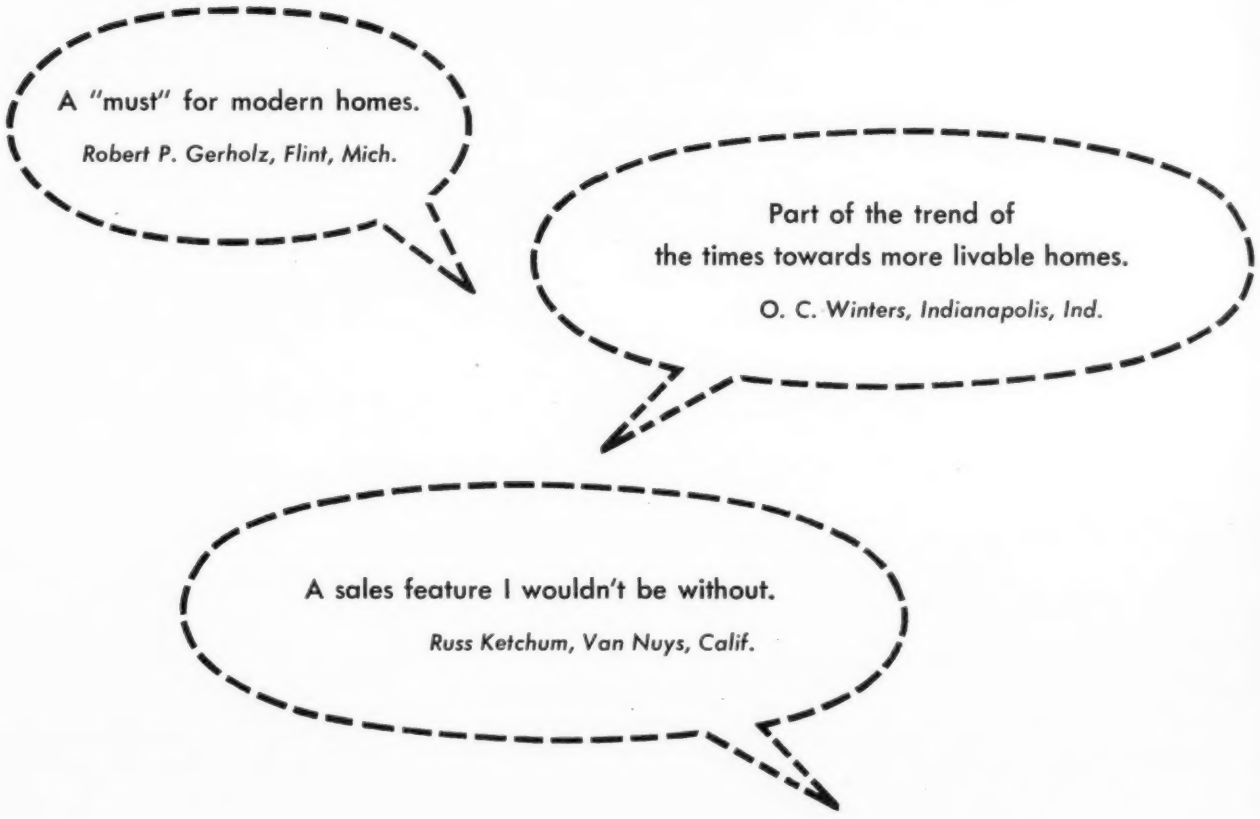


Sold Through Recognized Telephone Distributors

**THE ANSONIA WIRE & CABLE COMPANY · ASHTON · R. I.**

*The Oldest Name In Plastic Telephone Cables In The Most Modern Plant Devoted Entirely To Producing Plastic Cables*

# Selling builders on


A "must" for modern homes.
Robert P. Gerholz, Flint, Mich.
Part of the trend of
the times towards more livable homes.
O. C. Winters, Indianapolis, Ind.
A sales feature I wouldn't be without.
Russ Ketchum, Van Nuys, Calif.

Prominent builders all around the country are making statements such as these about the sales value of concealed telephone wiring and telephone facilities for new homes that are planned from the start.

One such builder is Robert J. Grillhoesl, of Milwaukee, Wisconsin, shown on the opposite page. He is featured in one of the nine testimonial advertisements being run during the year in architects' and builders' publications.

Testimonial advertising in leading trade magazines is convincing more and more builders all the time of the wisdom of planning ahead for telephone services. Rooms are neater with wires in the walls, convenience is greater when outlets are planned—so, home buyers are happier.

And homeowners are much more apt to order the additional telephones they need if provision has already been made for them.

This campaign for planned telephone facilities is another example of nationwide telephone advertising at work to build sales and win new customers for telephone services.

**BELL TELEPHONE SYSTEM**

XUM

# built-in telephone outlets

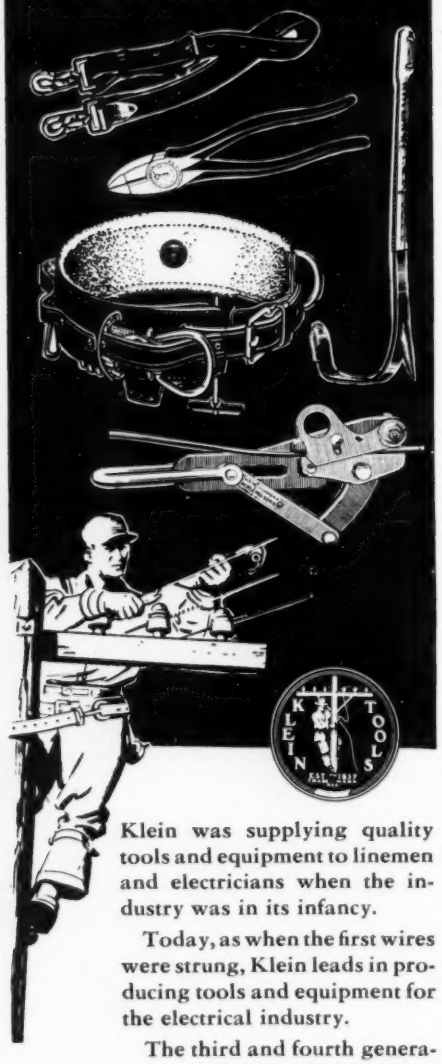
Helps us build homes we're proud to offer, and that customers are proud to live in and show to their friends.

*Richard Fox, Plymouth Meeting Park, Pa.*

Mr. Robert J. Grillhoesl, shown below (left), is a successful Wisconsin builder. His is one of nine testimonial ads to run during the year. These ads reach an audience of about 489,000 architects, builders and related businessmen, who read one or more of these magazines: *American Builder, Architectural Record, Electrical Construction and Maintenance, House and Home, NAHB Correlator, National Real Estate & Building Journal, PF—The Magazine of Prefabrication, Practical Builder* and *Progressive Architecture.*

# KLEIN

FOR GREATER SAFETY, BETTER PERFORMANCE




Klein was supplying quality tools and equipment to linemen and electricians when the industry was in its infancy.

Today, as when the first wires were strung, Klein leads in producing tools and equipment for the electrical industry.

The third and fourth generations of Kleins are still adhering to the quality standards set a century ago. The new Klein plant, equipped with the latest in manufacturing facilities, assures better, safer equipment, wherever power lines or communication lines are strung.

1857 100 YEARS OF SERVICE 1957

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent to you upon request, without obligation.

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS


# ABC OF THE TELEPHONE

*Concluded from page 24*

duced as the anchor is moved nearer to the pole.

If the lead is the same distance as the height, the guy is classified as having a 1-to-1 ratio. If the lead is two times the height the ratio is expressed as 1-to-2, with the height being expressed as the first factor. Following this same pattern, if the height is two times the lead, the ratio would be expressed as 2-to-1.

In actual practices the usual procedure is to consider 1-to-1 or 1-to-1½ as an objective. The greater the ratio in favor of the lead, the less strain there will be on the strand and the anchor installation. A favorable lead ratio would permit the use of a smaller guy wire and anchor.

However, in selecting a location for an anchor, consideration must be given to whether or not the anchor will be an obstruction or a hazard to the public. Thus, as will be illustrated later, the size of the guy wire and its associated anchor must be increased to offset, in some degree, the less favorable lead ratio as the anchor is moved closer to the pole to minimize the guy wire hazard at a particular location.

### *Modern Guying Practices*

As mentioned previously, there are many types of guy wire installations. Also, there are numerous factors involved in calculating their size and location. However, in spite of the many different situations in which guy wires are used, all guy wires have a single primary purpose—to provide a support or stabilizing factor to counteract a strain or load placed on a pole line.

Inasmuch as a guy wire is a pulling force, as different from a pushing force, provided by a brace, the fact should be kept in mind that the pull of a guy wire is most effective when it is placed directly opposite the load or strain. In short, the guy wire pulls against the load.

What kind of loads must be considered in the selection of a guy wire?

In most cases, a guy wire is designed and installed to perform a primary function. However, in some instances, guy wires perform secondary functions. A typical example is a guy wire installed at a corner pole which also is an effective storm guy. In a similar manner, various factors may have a bearing on determining the size or location of a given guy wire. These factors can be divided into three general types of loads as follows:

(1) Vertical loads as compared to a definite pull in either direction. In this group are:

(A) Weight of the wires or cable placed on a pole.

(B) For open wire the size and weight of crossarms and insulators.

(C) Weight of sleet, ice, or snow on the wire or cable plant.

(2) Directional loads where there is a definite pull in one direction in addition to the usual vertical load. This includes:

(A) Pull at corner poles.

(B) Dead-end loads.

(C) Strain caused by the contour of the earth.

(3) Variable loads where a directional type of load from any direction may be exerted against the pole line. A typical load of this type is wind pressure on poles, wires or cables.

NOTE: Pole height could also be included in this category because taller poles may be subjected to a larger number of incidental stresses than would shorter poles.

The pull or stress placed on a pole line is compounded or multiplied by a combination of loads from all the three general groups; for example, a heavy cable plant load, plus a coating of sleet on the poles and cable plant, and with a strong wind blowing.

## Government Intervention

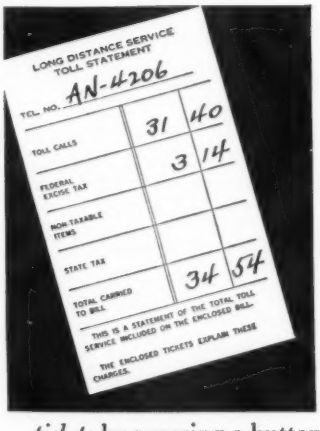
"Wherever the government intervenes in the economy, the intervention is automatically discriminatory and when long continued becomes self-perpetuating. The government intervened to help the farmer. And now Mr. Benson finds that there is nothing he can do—nothing that he can even cease doing—that does not adversely affect somebody. Let the government intervene to support farm prices, hold down rents, subsidize industry or give favoritism in freight rates; the govern-

TELEPHONE CO.
XXX FLOUR
HALE
"NOW ABOUT THIS PLACE WHERE YOU INSTALLED THESE TELEPHONES. YOU SAW A BLACKBOARD.... SOME HORSES' NAMES..... NUMBERS.... MEN TAKING MONEY.... THEN WHAT HAPPENED?"

Recordak Junior Microfilmer rents for as little as $17.50 per month; sells for as little as $550, according to model.

SHORT OF HELP?

# See what this $17.50 per mo. worker will do


LONG DISTANCE SERVICE
TOLL STATEMENT
TEL. NO. AN-4206
TOLL CALLS 31 40
FEDERAL EXCISE TAX 3 14
NON-TAXABLE ITEMS
STATE TAX
TOTAL CARRIED TO BILL 34 54
THIS IS A STATEMENT OF THE TOTAL TOLL SERVICE INCLUDED ON THE ENCLOSED BILL.
THE ENCLOSED TICKETS EXPLAIN THESE CHARGES.

**It will cut your billing time 40% or more** . . . let you prepare toll statements as concise as the one here. Doesn't matter how many toll calls a subscriber makes, you only have to list the total charges and tax.

How do you skip listing and describing each call? *You simply microfilm the toll tickets* by pressing a button . . . and send them out with the bill . . . eliminate the tedious detail you've followed for years.

*"Recordak" is a trademark*

**It will answer subscriber questions in advance.** With the toll tickets in hand, charges are readily recalled . . . bills are paid without fuss and delay.

Meanwhile, you have your photographically accurate and complete film records at your fingertips . . . in about 2% of the space formerly required. No extra film reader is needed—the versatile Recordak Junior has one built right in.

Is it any wonder that more than 200 independent companies have added this valuable worker to their staffs?

Prices quoted are subject to change without notice

**RECORDAK**

(Subsidiary of Eastman Kodak Company)

**originator of modern microfilming—and its application to telephone routines**

---

*MAIL COUPON FOR FREE FOLDER*

RECORDAK CORPORATION (*Subsidiary of Eastman Kodak Company*)
415 Madison Avenue, New York 17, N.Y.
Please send folder describing Recordak Toll Billing System in detail. SC-2

Name_____ Position_____

Company_____

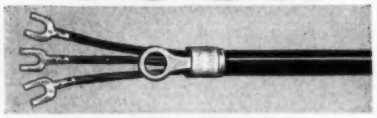
Street_____ City_____ State_____

DEPARTMENT OF TECHNOLOGY LIBRARY BUFFALO, N.Y.

# CORDS BY *Runzel*

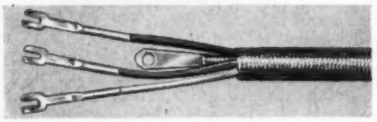
YOUR

NEOPRENE



BEST

NYLON



BUY!

COTTON

***Are you familiar with the features of these fine cords?***

**NEOPRENE** covered cords are a highly serviceable cord, extensively used in a wide variety of services. They are moisture and grease proof . . . easy to keep clean.

**NYLON** covered cords are a relatively new development in telephone cords. Their fine smooth texture makes them the preferred cords for switchboard use. They give long service. Preferred by operators because of their fast, easy handling.

**COTTON** cords are in standard use everywhere. Their fine woven wrap makes them very serviceable for all around purposes.

Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry a large stock of cords for every purpose.

***Our geographical location means QUICK SERVICE.***

**RUNZEL**
**Cord and Wire Co.**
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.


ment's action thereafter can no longer be neutral. It has laid claim to a wisdom it cannot fulfill with justice."—EDITORIAL STATEMENT, *The Wall Street Journal.*

## Industry Mobilization

"To 'tell our story and go forward' we can never be smug or content to rest where we are, in having dependable electric power when needed and where needed and priced low. This is our best answer to political power advocates. Political development of Niagara or of Hell's Canyon geographically may be far from almost all of us. However, political electric power from the atom with its tax dodgers of 'preference' can be a crash program in *any* area. Just as the problems of the United States have become world wide —so have the problems of our great industry become nation wide. We need to utilize every available legitimate tool to successfully cope with our national problems."—DONALD S. KENNEDY, *president, Edison Electric Institute.*

## Principle of Human Nature

". . . it suffices that, in the absence of its natural defenders, the interest of the excluded is always in danger of being overlooked; and, when looked at, is seen with very different eyes from those of the persons whom it directly concerns."—JOHN STUART MILL.

## H. I. Stecher Named to General of Ohio Post

Harold I. Stecher, staff assistant in the equipment engineering department of General Telephone Co. of Ohio, has been named assistant chief engineer of the company, effective Jan. 3. In his new post, he will play a key role in the plant expansion and improvement programs scheduled by the company during 1957.

A native of Brooklyn, N. Y., Mr. Stecher has had extensive experience in the telephone industry, having been associated with a number of New York State telephone companies, including the Otsego & Delaware Telephone Co. at Oenonta, the Sullivan Telephone Co. at Monticello, and the New York Telephone Co. in both up-state and down-state areas.

Mr. Stecher has had a distinguished communications career in the U.S. Army. As a reserve lieutenant in the Signal Corp., he was called to extended active duty in 1940, prior to the start of World War II.

During the war, and in the years immediately afterward, Mr. Stecher rose to the rank of Lt. Colonel, and was named chief of the engineering control division of the Signal Corp's Plant Engineering Agency.

**H. I. STECHER**

Upon his retirement from the Army in 1954, Mr. Stecher became an engineering consultant with Marion Engineering Associates, Inc., at Ocala, Fla. He joined the engineering staff of General Telephone Co. of Ohio in April, 1956.

Mr. Stecher is a member of the American Society of Military Engineers.

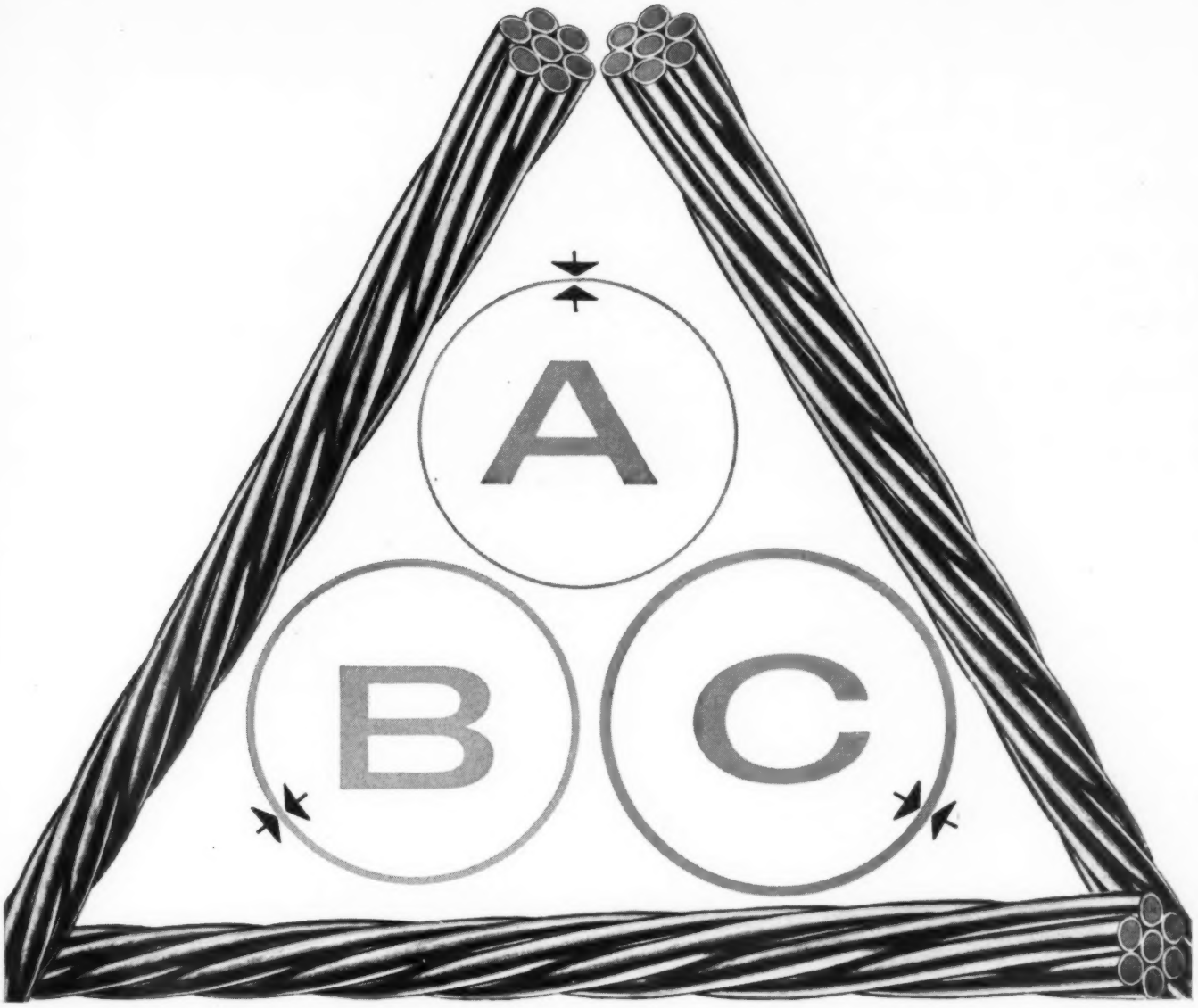
## Harry Reinhardt of California W&T Retires

Harry Reinhardt, vice president and chief engineer, California Water & Telephone Co., retired effective Jan. 31, after 28 years of service with the company, it has been announced by Chester H. Loveland, president.

**HARRY REINHARDT**

Mr. Reinhardt has been active in utility engineering since 1912 when he joined the early water works companies of Oakland and Berkeley. He stayed with these early predecessors of the East Bay Water Co. until 1928

*(Please turn to page 50)*




# The Right Coating Can Make All the Difference

The zinc coating on the wires of steel strand is put there to guard against rust. It is effective only as long as it remains intact. If it cracks or flakes away, then rust will soon begin its destructive work. Because of the need for complete protection over long periods, many buyers now insist upon Bethlehem strand with the bethanized coating.

Bethanizing is an electrolytic method of bonding zinc to steel. Developed by Bethlehem more than 20 years ago, it has proved its effectiveness in every part of the country. Reason: the bethanized coating is uniform, ductile, and tightly bonded, so that it resists chipping and peeling even under severe deformation. It's an "armor" that really lasts.

Moreover, this coating has an added advantage—a big one. It is available in three different weights, known as A, B, and C. The lightest, coating A, is equivalent to extra-galvanized. B is double the thickness of A. The heaviest, C, is triple the thickness of A. Thus a user can pick the coating that best suits conditions in his particular region.

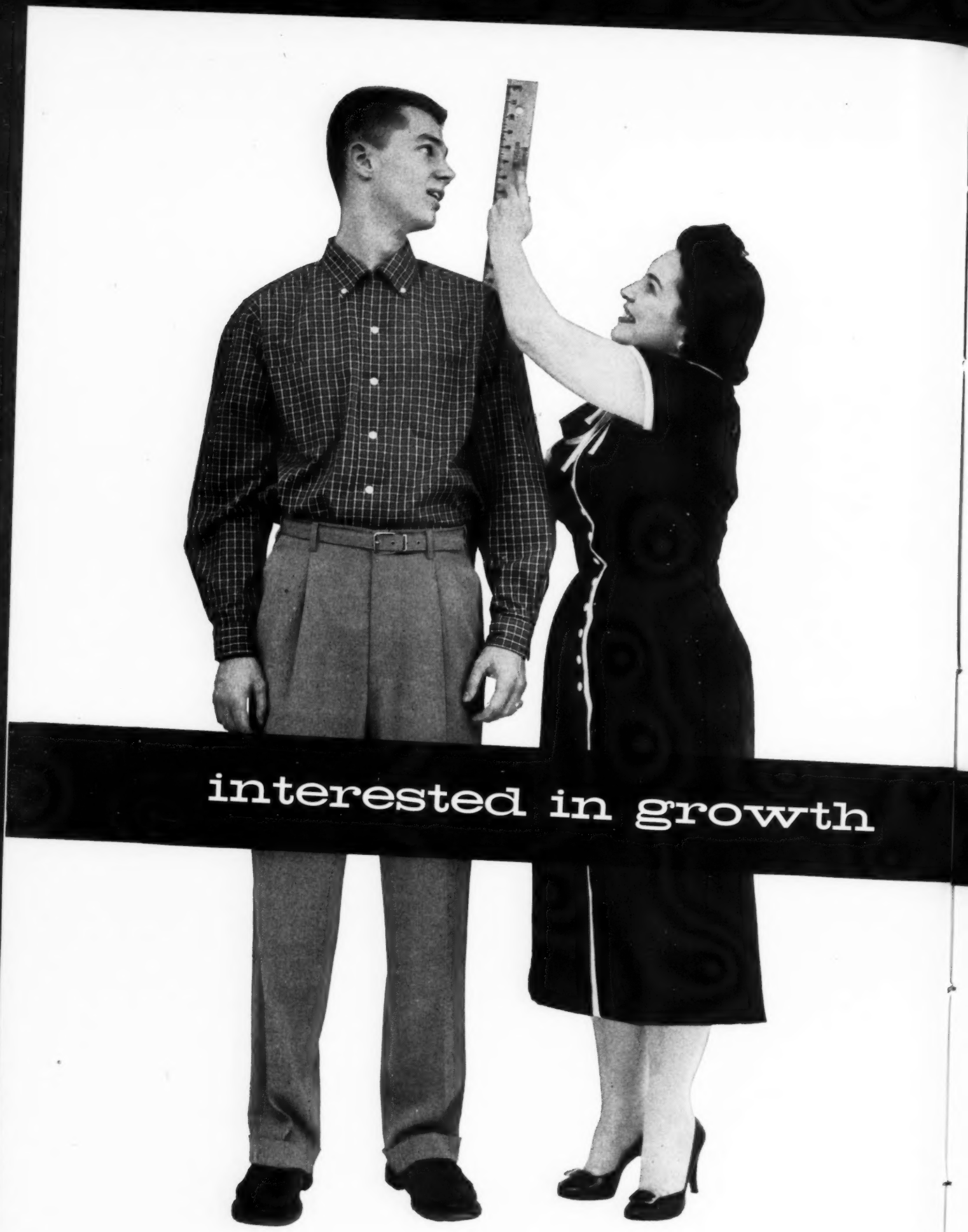
When you are planning new line installations, we suggest you thoroughly investigate bethanized strand. Details are available at any Bethlehem office. It will be in your interest to secure the full story from one of our engineers.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL




XUM

# Look how toll revenue is growing!

Like the little guy in short pants who suddenly towers over you and wants to know if he can use the car tonight, toll revenue by Independents has grown so big so fast it's almost unbelievable.

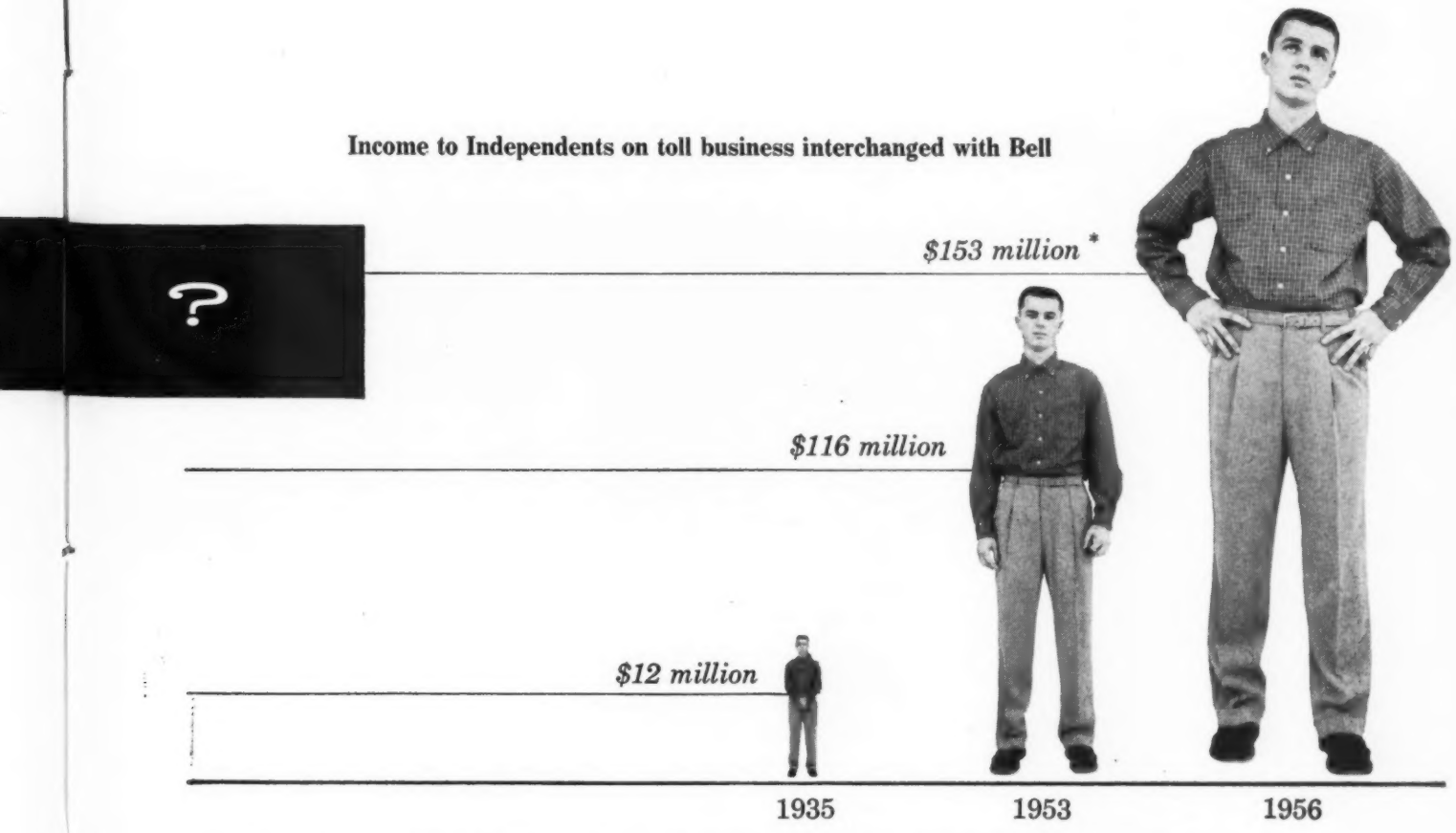
**QUESTION:** *Are you getting your full share of this mounting pile of toll dollars?*

If not, a suggestion . . . let Automatic Electric's carrier and radio engineers help you now in developing your toll circuits, TWX installations, telemetering and other special services that build toll revenue. Our specialists are ready and eager to go to work for you.

Just drop us a line today.

Automatic Electric Sales Corporation,
1033 West Van Buren Street,
Chicago 7, Illinois.

IN CANADA Automatic Electric Sales (Canada) Ltd.,
Toronto, Ontario.
*Offices in principal cities.*




**Based on "Report of Toll Compensation and Settlements Committee" 59th USITA Convention.*

AUTOMATIC ELECTRIC

*Originators of the dial telephone · Pioneers in automatic control*

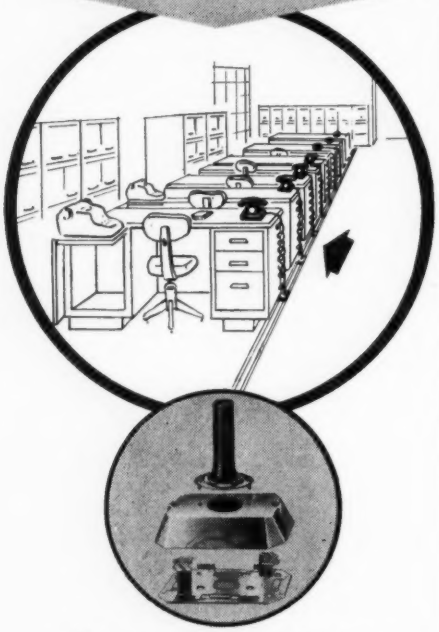
GENERAL TELEPHONE SYSTEM

# PANCAKE

**is the**

## *Modern Way*

**to carry communications wiring to the *point of use!***



Pancake is the streamlined, modern method of making individual telephone connections to office desks or communication points in factories. The galvanized steel, *trip-proof* surface raceway can be quickly and economically installed with a *minimum* of interruption to office or factory routines.

Features added to the newly developed 1546T Telephone Outlet Box, *illustrated above,* provide (1) an ingress for 2600 Pancake, and (2) the "split bridge", which extends the versatility of this fitting, provides a more simple means for the installation of the 47B terminal block, and facilitates the use of the fitting for through wiring.

*Specify 1500 Pancake for JKT Conductors; 2600 for telephone cable.*

For further information write Dept. T-4

THE WIREMOLD COMPANY
HARTFORD 10, CONN.


when the properties were purchased by the East Bay Municipal Water District. When he left the East Bay company, he was acting as its assistant general manager.

He served in the U. S. Army Engineers during World War I and was discharged in 1919 as a captain.

Mr. Reinhardt's early duties with the Loveland organization consisted of engineering studies for the purpose of purchasing and consolidating various water and telephone companies. He served in Texas, Oklahoma and California. As an engineer with the Loveland firm, he also made numerous other utility studies.

When California Water & Telephone Co. was organized in 1935, Reinhardt was appointed vice president and chief engineer. In this capacity, he was responsible for the construction during 1943-1945 of Loveland Dam near San Diego and Los Padres Dam on the Monterey Peninsula in 1948-1949.

He is a member of the Society of American Military Engineers and the American Water Works Association. Mr. Reinhardt served as president, California section, AWWA in 1939.

## R. J. White Named by General of Southeast

Robert J. White has been appointed industrial relations director of the southeastern group of General Telephone System companies, effective Feb. 16, it was announced on Jan. 22 by General Telephone's president, Donald

R. J. WHITE

C. Power. Mr. White is being transferred to the southeastern group, with headquarters located at Durham, N. C., from General Telephone Co. of Michigan, where he has been secretary and treasurer since March of 1951.

A graduate of Carroll College in Waukesha, Wis., Mr. White received

1. BASHLIN Quality Tool Buckets . . . (Built to Last Longer) The original Fibre Top Buckets
2. Good, Tough Buckskin Work Gloves
3. BASHLIN Quality Boots and Footwear
4. BASHLIN Quality One Piece Steel and Adjustable Aluminum Climbers with Replaceable Gaffs
5. BASHLIN Body Belts with additional Nylon Safety Feature
6. BASHLIN Leather and Nylon Safety Straps

*Distributors in Strategic Areas in U.S.A.*

EXPORT: Copperweld Steel International Co.
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*Ask for . . .*
CATALOG NO. 156

W. M. BASHLIN CO.
GROVE CITY, PA.

# Nicopress
## the TOOL and the SLEEVE

They work together to make the perfect splice

## It's Easier to Buy NICOPRESS SLEEVES from SUTTLE

All popular sizes of telephone sleeves are illustrated with exact scale drawings in the Suttle Catalog—No guesswork as to which style and size you want.

Order Nicopress Sleeves along with other supplies from Suttle for prompt shipment.

See Your SUTTLE Catalog

Serving Independent Telephone Men Since 1910

Suttle EQUIPMENT CO.

LAWRENCEVILLE ILLINOIS


his Ph.B. degree in 1938. He has been associated with General Telephone System since November of 1938, at which time he joined General Telephone Co. of Wisconsin in the auditing department. Mr. White has had various assignments with General Telephone subsidiary companies in Indiana and in Illinois.

### Announce Further Plans for USITA Engineers' Seminar

The Personnel Sub-committee on Engineering Education of the United States Independent Telephone Association on Feb. 4 announced further details of its plans for the first annual seminar for telephone engineers.

The sub-committee has completed preliminary negotiations for the four-week session to be held at Kellogg Center on the campus of Michigan State University at Lansing, Mich. Tentative dates of the 1957 seminar are June 30 through July 27. Because of space limitations and the desire to afford small group discussion, the registration will be limited to 75 participants.

The tentative curriculum is designed to treat professional engineering techniques and significant new advances in technology in the light of economic selection and management decision, the sub-committee states.

More specifically, a subject area such as probability theory would be treated for review and orientation purposes and then related to practical matters of telephone trunking design.

Instructor personnel will be drawn from the faculty of Michigan State University and augmented by engineering and management leaders from the industry. Certain other guest speakers will be invited from related industries and other colleges and universities.

The program is being designed so that engineering personnel associated with any of the research, manufacturing, supply or operating segments of the Independent telephone industry can participate and benefit. If this objective can be obtained, a significant contribution to the advancement of the Independent industry can be had, the sub-committee says.

The present sub-committee consists of P. H. Henson, chairman; F. E. Norris and R. J. Loveland. The sub-committee plans to present complete details of the seminar in a brochure which is being readied for distribution in March.

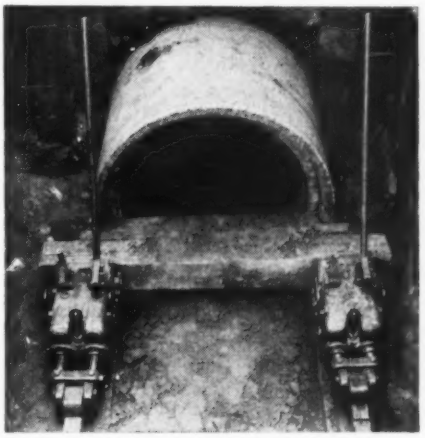
### A Sobering Thought

"In times like the present, men should utter nothing for which they would not willingly be responsible through time and in eternity."— ABRAHAM LINCOLN.


# FAST, EASY WAY TO INSTALL PIPE... AT LOWER COST

## PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

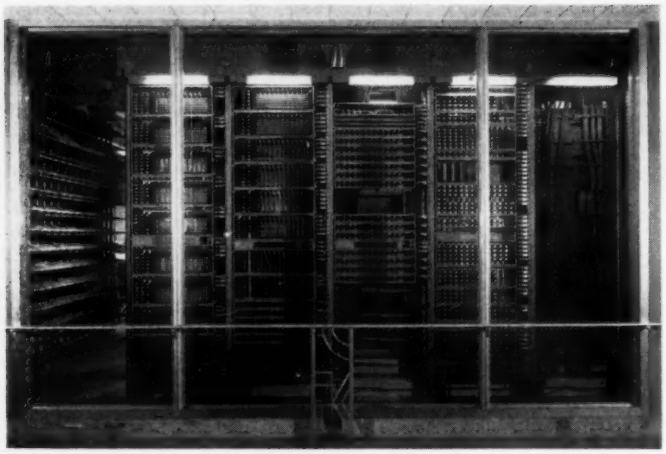
Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.



TOOLS FOR CRAFTSMEN

GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2062 Columbia Avenue, Rockford, Illinois, U.S.A.



**LEFT PHOTO: North By-Path crossbar switching system is viewed through panoramic window in main lobby of the new Seymour, Ind., exchange building. RIGHT PHOTO: Portion of new 14-position blonde mahogany toll boards and chief operator's desk in Seymour exchange.**

## Seymour, Ind., Cuts Over Crossbar System

North Electric Co. of Galion, O., has announced the cut-over of its first By-Path crossbar switching system at the Seymour exchange of The Indiana Telephone Corp.

The North crossbar equipment employs markers and registers that "look at" or analyze groups of circuits in rapid progressive stages without stepping, and instantaneously and automatically selects the first available path that will not be blocked at any stage of operation, according to the company.

**W. J. Scheidler (left), E. S. Welch (second from left) of Indiana Telephone Corp. stand by as Mayor Isaacs of Seymour throws power switch for new crossbar system. North's president, Hans Kraepelien (second from right), and Indiana Telephone Corp.'s president, P. F. Goodrich (right), look on.**

The North company states that all the forward steps in telephony are available in its new system, including Direct Distance Dialing (DDD), automatic toll ticketing, automatic line identification for toll ticketing, automatic routing and automatic traffic metering. Features claimed by the company include split-second accurate switching, high ratio of completed calls, greater switching capacity with less equipment in less space, and flexibility which permits easy expansion for more lines, suburban exchanges and toll trunks by "jacking in" crossbar switch and relay units.

The Indiana Telephone Corp. constructed a new single story gray-yellow brick faced exchange to accommodate its new equipment. A view of the switching system greets all who enter the lobby through the glass and stone main entrance. Commercial and staff offices are brightly decorated in combinations of glass, wood paneling and pastel green metal partitions. A separate extrance for toll operators divides a comfortable lounge from the main toll board room. Positions for 14 operators are provided in North's newly designed blonde mahogany toll boards. Ample space in the switchboard room is available for future additions.

## Ohio Consolidated Reports Cable Cutting Continues

Cable cutting attacks in the Portsmouth, O. area in the strike against Ohio Consolidated Telephone Co. knocked out an additional 1,524 telephones on the nights of Feb. 5 and 6 in Scioto County. These latest attacks swell the total of cable cuts in Portsmouth since Jan. 1, to 163, according to the company.

The strike began on July 15, 1956 (TELEPHONY, Jan. 19, p. 56; also Aug. 18, 1956, p. 45).

The number of telephones now operating in Portsmouth is well below 3,000 out of 17,000 normally connected to the area's exchange.

Twelve cuts were made on the night of Feb. 5, with an additional nine on Feb. 6.

The new cuts affected primarily Portsmouth's business sections, including the city's leading department store, two hotels, radio station WNXT, and a host of other commercial establishments. Also affected was the Portsmouth police network, the lines leading into a hospital, and one entire residential section.

At one point vandals entered a manhole and slashed a 900-pair cable.

Another cut also completely disrupted long distance communications between Lucasville, 9 miles north of Portsmouth, and the outside world. Local service in Lucasville was also disrupted by the cutting of a ground line immediately outside that city's automatic exchange. Lucasville normally has over 400 telephones in operation.

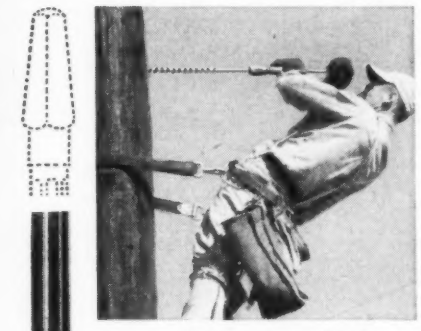
The company states tension has been mounting steadily in the Ohio river city with company repair crews reporting increased numbers of pickets harassing them in their desperate efforts to restore chopped and hacked cables to operating condition. Portsmouth police have stepped up the number of men assigned to strike duty in an effort to parry the threat.

## Urges Highway Courtesy

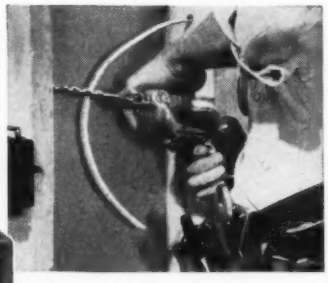
"With rain, snow, slush and road residues on the highway there is a continuous spray of film against windshields with resulting poor visibility. Courtesy on the highway could do much to reduce this hazard."—*Grand Rapids* (Mich.) *Times.*

# New adapter shank bit

**fits either hand brace or power drill**



Taper square shank fits hand braces



Cut off taper and use "hex" shank in both power drills and hand braces

## *Cut your wood bit inventory by 50%*

Now you can eliminate the need to stock two types of wood auger bits. Irwin's new Adapter Shank Bit fits both hand braces and power drills.

With hand braces, use the Adapter Shank Bit as it comes. Cut off taper square and the Adapter Shank, with its 6 "hex flats", chucks perfectly in power drills or hand braces, either one. No wobble, no run-out. Clean, efficient cutting action. Reduces inventory and record keeping by 50%. Saves time on the job, too. Call your distributor, or write today for complete information. Sizes 4/16 to 17/16 inches.

***All Irwin Adapter Shank Wood Bits** are forged in one piece from special steel and heat tempered full length for longer life. Plastic coating on balanced cutting heads guarantees factory-fresh sharpness, unequalled performance. Widely used by utilities, electricians and construction workers.*

**IRWIN** auger bits • screw drivers

Wilmington, Ohio


## Graybar Makes Announcement Of Four Appointments

Graybar Electric Co., Inc., recently announced the following appointments:

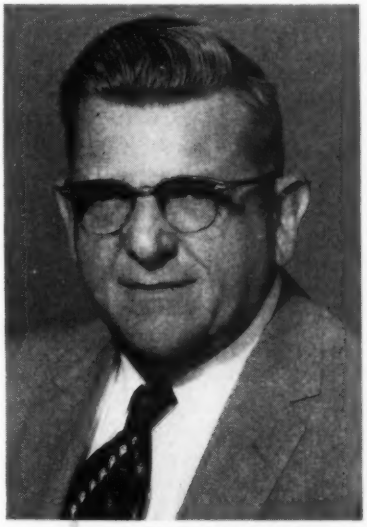
S. A. Faren will become manager of Graybar's Grand Rapids office and warehouse, effective Feb. 16.

W. T. Bronson was appointed district sales manager at Queens Plaza, Graybar's eastern district office, also effective Feb. 16.

J. T. McGrath named operating manager at Newark, and W. E. Boe, operating manager at Roosevelt Field, both effective Jan. 28.

## Buckeye Company Announces Territory Realignment

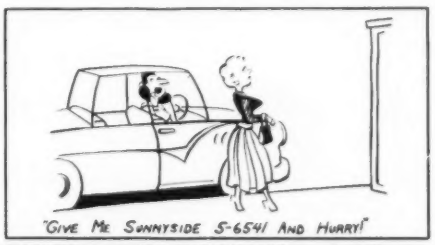
The realignment of existing territories and the opening of a new direct sales district has just been announced by Buckeye Telephone & Supply Co. of Columbus, O. R. L. Hepner, sales

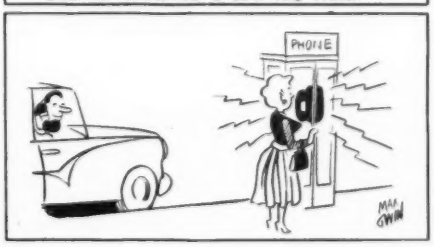


W. S. RICHARDSON

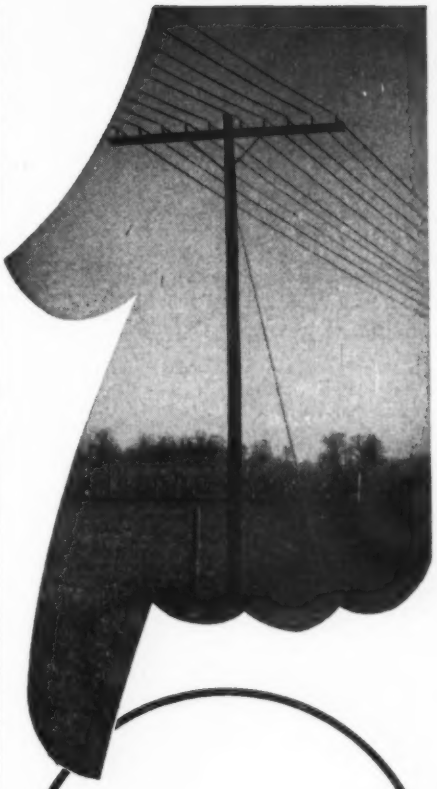
manager for the firm, pointed out that the new assignments would mean closer contacts with clients heretofore not regularly serviced by sales personnel.

Mr. Hepner also revealed that Buckeye, for over 35 years a leading supplier to the Independent telephone







**Crapo HTL-135**

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA U. S. A.

# LOWER Cost Per Mile

● **Efficient rural telephone circuits can be built at minimum overall cost where *Crapo* HTL-135 High-Tensile Line Wire is used to full advantage. For *Crapo* HTL-135 makes possible spans up to 350 feet in heavy, 540 feet in medium and 650 feet in light loading districts. Longer spans mean fewer pole structures with substantial savings in material and labor costs per mile.**

**The rugged tensile strength of *Crapo* HTL-135 and its heavy galvanized coating provide dependable and economical service life on typical rural lines.**

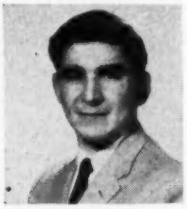
**Ask your jobber for details or write direct for engineering data!**

**INDIANA**
**STEEL & WIRE COMPANY**
**Muncie, Indiana**

# construction and maintenance DIGEST

- **Able cable**
- **Profitable noise**
- **Self-supporting**
- **5-in-1 protection**
- **Pennies for power**

Published regularly to help you get the most out of your materials and supplies dollar



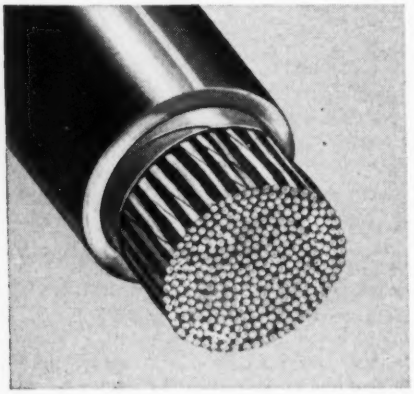
*by Frank R. Kasper, Inside Sales—Atlanta*

At our house, we have a dynamo of atomic automation—she's just under 2 years old and keeping up with her is a big job—but fun. It's just the same keeping up with your needs for supplies: big job—but fun. It's satisfying work to know the parts and equipment I send you—are finest in the world. Why am I so sure they're best? Because they come to you with a double guarantee—the maker's . . . and Stromberg-Carlson's. And along with the protection you get from Stromberg-Carlson's 62-year reputation—you get the promise of new and better telephone equipment from the research program your orders help support. Thanks for the mighty fine business you've given us—we sincerely appreciate it!

### Uniformity, Dependability, Lasting Service

When you've said that about cable you've covered about everything.

Kennecott Telephone Cable fills the bill in uniformity, dependability, lasting service for our telephone cable customers.



Before a single inch of Kennecott cable leaves the mill, it is tested for Dielectric Strength, Insulation Resistance, Conductor Resistance, Capacitance and Fixed Dimensions. Such care in manufacture is your warranty of efficient, trouble-free performance in the field.

Specify Kennecott — distributed by Stromberg-Carlson.

### Noise can be money!

Take a business subscriber who has a telephone in some extremely noisy location—and who has finally decided to do something about it. Would you rather have him spend money in building a soundproofed booth—or give **you** the money as monthly income on a telephone which completely licks the noise problem?

The GAI-PHONE is such an instrument. It has a special transmitter that actually creates a "Zone of Quiet" around the handset—even in a spot as noisy as a boiler factory!

### Distribution wire needs no cross arms

There are several reasons you can enjoy lower installing costs with this Whitney Blake multi-pair distribution wire.

Because it's self-supporting, it needs no cross arms. And it's easy to string because it's lightweight and comes in long lengths—up to 4000 feet per reel.

Self-supporting distribution wire has built-in messenger.

This wire has excellent electrical characteristics: low-loss transmission, low capacitance, high dielectric strength.

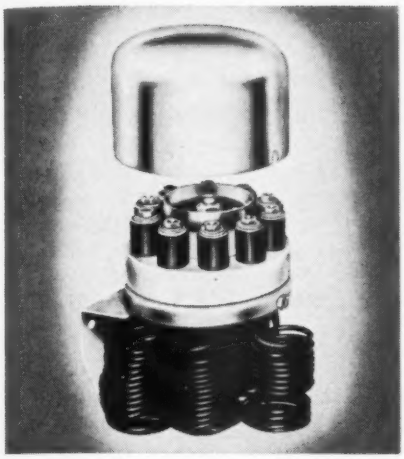
Its polyethylene insulation provides excellent weather resistance.

The wire is available in 3, 6, 11 and 16 pairs. The conductors are of #19 A.W.G. soft copper.

### Protects 5 circuits at low cost

You get low-cost protection for 5 circuits with Cook Electric Company's Hy-Cap Power-Cross Protector—a single compact unit with only one ground wire.

In the assembly of this unit 10 carbon electrodes are fixed to a porcelain base which has a snug-fitting, weatherproof aluminum cover. Each electrode has a fusible element which forms a direct path to ground when an extended discharge occurs. Ten insulated copper wire leads are factory-connected to the protector and cut to correct lengths for installation on a 10B crossarm. Wire entrances are sealed with rubber grommets. A steel bracket makes mounting easy.

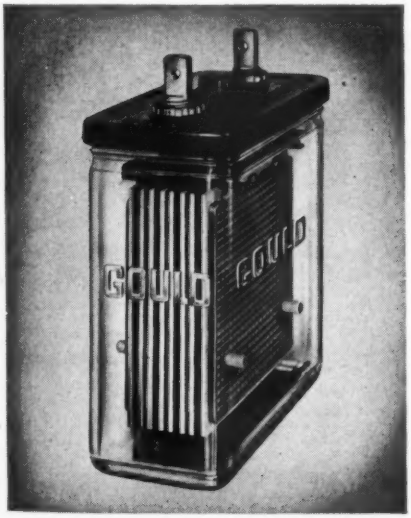


Protect 5 circuits with this one compact unit.

If all 5 wire leads are not needed at installation time, you can leave the extra wires coiled until facilities are increased.

**Battery has lowest yearly cost**

There's an easy way to save money on switchgear, signal and alarm systems or emergency light and power applications.




Gould Planté rolls up excellent service records—cuts maintenance to a minimum.

Amazing service records have proved that Gould Planté batteries have the lowest yearly cost of any battery you can use. Pure lead positive plates help make this possible.

*Distributed by*

**STROMBERG-CARLSON**

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

industry, is also expanding its operations in the industrial and manufacturing supply fields. Plans for this expansion were presented to sales personnel at the recent two-day meeting held at the home offices.

Warren S. Richardson, Tallahassee, Fla., has been appointed sales repre-

C. A. GILLESPIE

sentative of the newly created southern district which will include the states of Florida, Georgia and South Carolina. Mr. Richardson, whose background includes plant operations as well as sales, has long been active in southern telephone circles. Prior to joining Buckeye, Mr. Richardson was associated with North Electric Co. as southern regional sales manager.

H. G. WIRTZ

Clarence A. Gillespie, Worthington, O., who has been serving Buckeye customers in Ohio since 1935, will cover the southern half of Ohio and parts of Kentucky and West Virginia.

Harold G. Wirtz, Findlay, O., a Buckeye sales representative for the past six years will include the southern part of Michigan and the northern half of Ohio in his district.

Calling on accounts in the states of Indiana, Illinois and part of Kentucky is Glenn R. Michael of Ossian, Ind. Mr. Michael, prior to joining the Buck-

G. R. MICHAEL

eye sales staff last year, was associated with the line construction departments of several telephone companies and the maintenance department of the Ft. Wayne Bible School.

The eastern sales district comprising the state of Pennsylvania and parts of New York and New Jersey will be covered by Robert Rozman of Pitts-

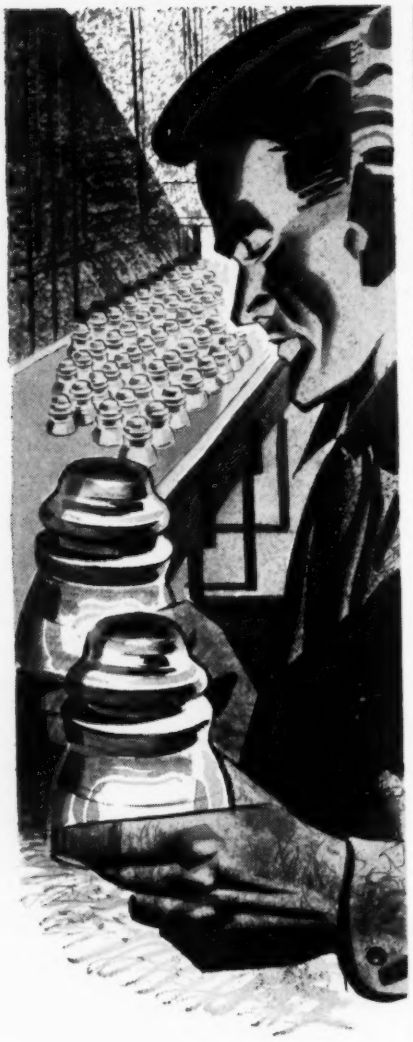
ROBERT ROZMAN

burgh, Pa. A former sales representative for Graybar Electric Co., Inc., Mr. Rozman joined Buckeye in 1955.

Mr. Hepner also announced the promotion of Charles Hamilton, Columbus, O., to head the office sales department, a vacancy created with the recent death of E. T. Tippett. Assisting Mr. Hamilton in his new position will be Sam Turner, office sales, and George Studebaker, stock records.



XUM



# Uniform

The insulators coming off the lehr above are *uniform*. Each one meets the same rigid standards for mechanical strength, accuracy of thread contour, and resistance to thermal shock. This uniform high quality means you can count on the same dependable performance from all your Armstrong Insulators. For full details on every model in the line, write Armstrong Cork Co., Glass and Closure Div., 295 Fifth Ave., New York 16, N. Y.

Armstrong
GLASS INSULATORS
*for communications . . . for power*

# Helpful Literature

**LINEMEN'S TOOLS AND EQUIPMENT**—Mathias Klein & Sons has just issued a completely revised catalog showing pliers and electricians' and linemen's tools and equipment. Included is a new feature that will be of special interest to plier users. Dimensions of each part of every plier—length of handles, of cutting knives, of nose, width of head, point, etc.—are given in detail. Request HL328.

•

**LEAD CALCIUM BATTERY REPRINT**—C & D Batteries, Inc. announces that reprints of "The Pros and Cons of the Lead Calcium Battery," by Henry E. Jensen, are again available.

The article, which originally appeared in the July 9, 1955 issue of TELEPHONY, is illustrated by five graphs and contains factual answers to questions about the battery. Request HL329.

•

**BATTERIES**—Exide Industrial division of The Electric Storage Battery Co. has publishel a catalog describing its new type EWA battery for telephone service.

The catalog highlights the development of the battery's positive plates, constructed of a blend of lead, antimony and Silvium, Exide's patented alloy of lead, silver and other metals. This blend assures long battery life and protection against corrosion.

The four-page catalog also features the battery's lightweight, heat-resistant, shock-absorbent polystyrene jar. Battery elements are suspended from ledges molded within the container walls.

One-, two- and three-cell EWA units are illustrated, and the catalog contains a table showing their rated capacities, dimensions, weights and other data. A full-page cutaway photograph shows details of the cell construction. Request HL330.

•

**BOOTHS**—Suttle Equipment Co. has published a new catalog showing its line of shelf-type telephone booths—including its unit-row, modular, commercial and industry types—and its full-length booths, both with and without doors.

Also shown is the Handi-Booth, an outdoor booth which is supplied with a 6½-foot steel mounting post which can be set in a post-hole filled with concrete, and then used for drive-in or walk-up service. Request HL331.

•

**WIRE AND CABLE REELS**—Another brochure announced by Suttle Equipment Co. contains information on wire and cable reels and measuring equipment.

Included are sections on payout reels, reel mounts, squirrel cage reels, extra heavy duty reels, messenger strand dispensers, store room reels, and wire measuring meters. Request HL332.

•

**SUBSCRIBER-ATTENDED PABX**—Automatic Telephone & Electric Co., Ltd. has issued two brochures on subscriber-attended private automatic branch exchanges—one about the Strowger 20-line PABX, the other on the nine-line PABX.

The Strowger PABX Type 20-5-5

**TELEPHONY PUBLISHING CORP.**
**608 S. Dearborn St.**
**Chicago 5, Ill.**

**Please have the manufacturer send me without obligation further information on the products described in the following numbers:**

**HL328**_____; **HL329**_____; **HL330**_____; **HL331**_____;

**HL332**_____; **HL333**_____; **HL334**_____; **HL335**_____;

**HL336**_____; **HL337**_____; **HL338**_____.

**Name**..... **Title**.....

**Company**.....

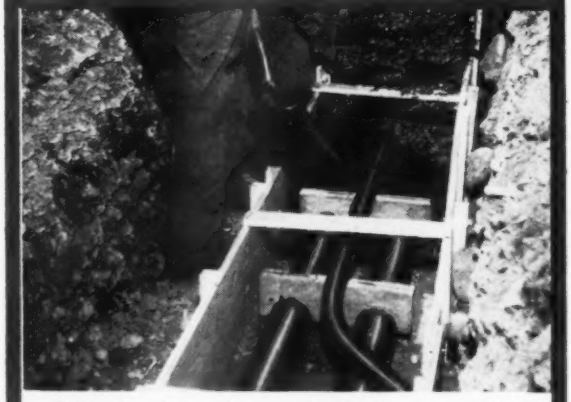
**Street**.....

**Town and State**.....

**2/16/57**

Butyrate conduit is so light that one man can easily lift six 20' lengths, 2" in diameter.

Slip-sleeve couplings and solvent cement join lengths of Butyrate conduit quickly and permanently.



Butyrate conduit can be covered with concrete or subjected to any normal backfilling operation.

Butyrate's resistance to corrosive and electrolytic attack permits installation even in strong alkali soils.

Flexibility of Butyrate conduit permits it to follow ditch contours without the use of fittings—even a 90° bend, as here.

# Specify Tenite Butyrate cable conduit for faster, easier installations that last longer

Cable conduit made of Tenite Butyrate offers you these specific advantages over ordinary conduit: It can be handled, cut and joined with ease and can be bent around most obstacles—which means that installing conduit for power lines and telephone cable need no longer be a long or expensive process. It has an impact strength often lacking in other materials and in service, is unaffected by corrosive or electrolytic action of soil—your assurance of long years of trouble-free service.

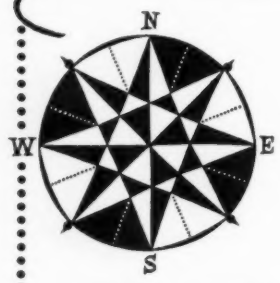
Find out how cable conduit of Tenite Butyrate can save you time, labor and money. For more information and the names of manufacturers supplying Tenite Butyrate conduit, write: EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

**TENITE**
**BUTYRATE**
*an Eastman plastic*



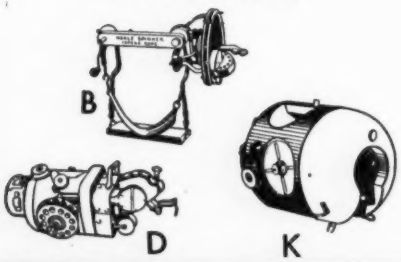
XUM

TO THE NORTH
TO THE EAST
TO THE SOUTH
TO THE WEST




YES, IN EVERY DIRECTION YOU'LL SEE NEALE SPINNERS OUT PERFORMING ALL OTHERS —

—THE RESULT OF YEARS OF EXPERIENCE IN THE FIELD PERFECT DESIGN THE FINEST MATERIALS SUPERB WORKMANSHIP AND THE HIGHEST OF MANUFACTURING STANDARDS




CABLE SPINNING EQUIPMENT CO.
3100 TOPEKA AVE.
TOPEKA KANSAS
Serving the growing Independent telephone industry
UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION
OVERSEAS SALES:
Ericsson Corp. of New York
Automatic Electric of Canada
Pirelli of Great Britain

provides internal communication facilities between 20 extensions permitting a maximum of five simultaneous conversations and also offers direct access, for five simultaneous conversations, to the public exchange network from all or a selected number of extensions. Request HL333.

•

HEAD PROTECTION—A new 12-page cartoon booklet, "Attempted Murder," explaining the importance of safety head protection and the "care and feeding" of hard hats, has been prepared by E. D. Bullard Company. It is available to all safety engineers for distribution to men who wear hard hats.

A recent survey demonstrated that almost 45 per cent of the men now wearing head protection were wearing it incorrectly for maximum protection.

The federal specifications recommend that all hard hats be worn with a clearance of not less than 1½ inches between the crown of the hat and the top of the head. This is normally referred to as crown clearance. The greater the crown clearance, the greater the potential energy absorption of the hard hat and the greater protection.

In actual use crown clearance varies with the wearer and depends to a great extent on comfort and appearance.

As it is difficult for the wearer to adjust to the proper crown clearance, the majority of the men wearing head protection have their hard hats adjusted to less than specifications, thus lowering the efficiency and value of the hat.

To give maximum protection, in addition to proper crown clearance, the wearer always should wear the hat straight on his head. Also, safety hard hats must be given proper care if the wearer is to secure the maximum protection. Instructions for this care are included in the booklet.

"Attempted Murder" contains case histories from the files of "Hard-boiled" Harry, graphically illustrated with cartoons to dramatically demonstrate the importance of wearing safety hard hats and the importance of wearing them correctly. Request HL334.

•

INDUSTRIAL TELEVISION—An eight-page descriptive brochure has just been issued covering Philco's newly designed line of industrial Television equipment. The booklet contains many illustrations of the latest developments in cameras, monitors, controls, lenses, and other accessories that are required to create any kind of camera chain.

Included in the new line are cameras with full remote control for adjustment of focus and iris apertures and for both high and low speed tilt and pan. Also listed are special weatherproof and explosion resistant housings as well as various lenses and turret heads.

Great interest has recently developed in the many uses for closed circuit television: industrial organizations, educational institutions, hospitals, utilities and many other users have found it indispensable where distant or inaccessible areas must be kept under observation. To meet this demand, the new Philco line, presented in this booklet, is especially designed to give high resolution with much greater reliability, the company states. Request HL335.

•

PROTECTIVE RUBBER GLOVES—A 32-page illustrated catalog for use in telephone, public utility and other fields has just been published by the Charleston Rubber Co., a leading manufacturer of protective rubber gloves and sleeves for use in working with high voltages.

Profusely illustrated, and printed in three colors on heavy gloss enamel stock, the plastic-bound catalog fills a long-awaited "under-one-cover" need in the electrical protective equipment industry, the company states.

The new catalog tells of the company's program of laboratory research and explains in detail how CHARCO high voltage protective equipment is manufactured and tested. It describes and illustrates many products of the Charleston Rubber Co.; and it gives clear, concise instructions as to proper care and use of high voltage rubber protective equipment, according to the company. The catalog also lists valuable informative technical reports available free from the company, including the free 18 inch x 22 inch glove care poster.

Among the CHARCO products featured in the catalog are the FLEX-SAF and FLEX-FIT linemens' high voltage protective rubber gloves and sleeves, including FLEX-SAF Contour Cuff gloves; "Bulldog" blanket and wire clamps; "Bulldog" utility flag clamp and danger flags; "Charcote" water repellent spray; CHARCO low voltage gloves; glove protectors and innerliners; canvas storage bags for gloves and sleeves; danger flags; flag standards; and other products for safety.

The catalog includes a glove selector chart, ordering instructions and price list. Request HL336.

•

TECHNICAL MAGAZINE—The first issue of a new technical magazine, *The Western Electric Engineer*, was pub-

# GLADWIN PLASTICS, INC.

is proud to announce the election of

## MR. EARLE BLOMEYER

to Vice-President & Member of Our Board of Directors

SUPPLIERS to the Telephone Industry OF:

★ World-famous GLO-DOMES and TRI-DIRECTIONAL SIGNS for outdoor booths
★ TELEPHONE AHEAD signs for highway booth signing
★ Revenue-producing QUALITY PLASTIC SIGNS for indoor booths
★ CARRYING CASE for MINIATURE COLOR telephones
★ Numerous other MERCHANDISING ITEMS for the telephone industry
★ PLASTIC PARTS FOR CENTRAL OFFICE EQUIPMENT

for further details write:
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GLADWIN PLASTICS, INC.
165 COURTLAND ST. N.E.
ATLANTA, GEORGIA
Telephone: JAckson 5-5384

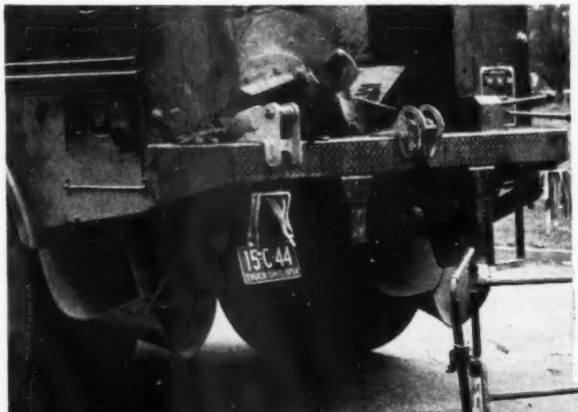
# GORMAN-RUPP PUMPS

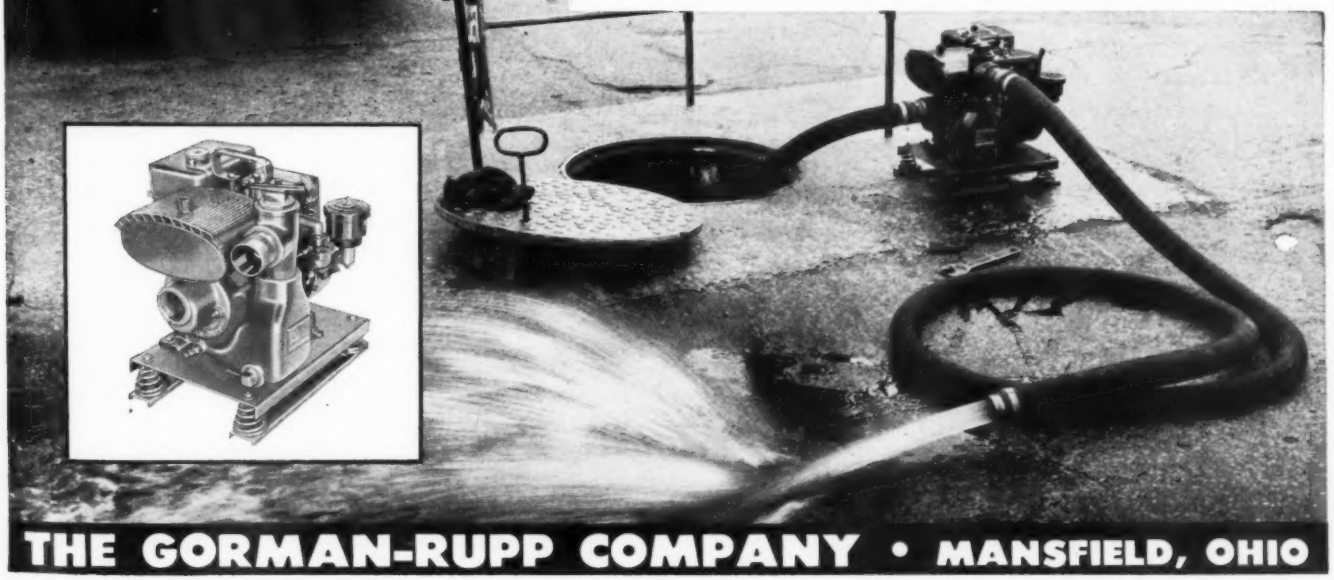
## *Designed for Telephone Companies*

**QUIET — STURDY — EFFICIENT**

Especially for **quiet** zones — ideal for residential areas. Equipped with quiet accessories, including muffler and hand throttle.

***ASK FOR TELEPHONE PUMP BULLETIN***





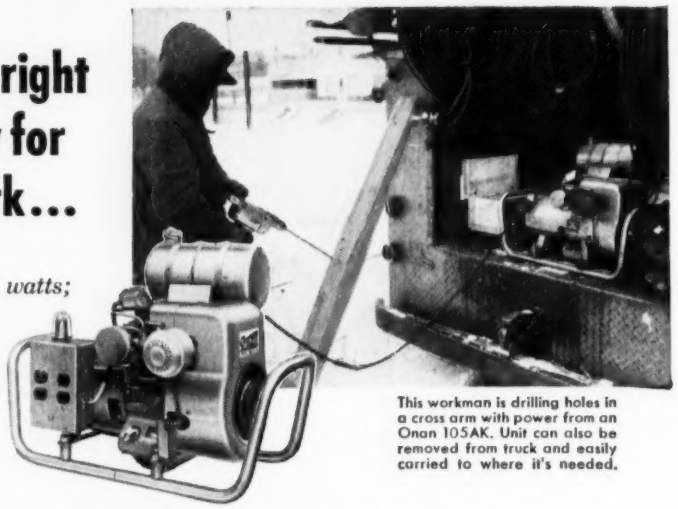
**THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO**




XUM

# Just the right capacity for line work...

*develops 1500 watts; weighs only 125 pounds; 4-cycle engine power*



This workman is drilling holes in a cross arm with power from an Onan 105AK. Unit can also be removed from truck and easily carried to where it's needed.

## Onan Model 105AK-1P Electric Plant

This power-packed lightweight plant supplies all the power you need for electric drills, saws and other equipment . . . and for floodlighting on night jobs, too!

Quick-starting, 4-cycle Onan air-cooled engine is direct-connected to Onan all-climate generator in a single, permanently-aligned compact unit.

Four plug-in receptacles, pilot light and carrying frame are standard. Other lightweight portable and mobile Onan plants from 500 to 10,000 watts.

To save time and speed work on construction and maintenance projects, equip your crews with Onan Portable Electric Plants.

Call your Onan distributor or write . . .

Onan ELECTRIC PLANTS

**D. W. ONAN & SONS INC.**

4049 University Ave. S.E., Minneapolis 14, Minnesota

# Linemen call this hoist a "HONEY"

## Designed especially for line work

Here's a strong, fast-operating, light-weight hoist (12 pounds) with a flexible steel load chain that won't kink, bind or uncouple. Controls can be worked without removing gloves. It's rated to lift a one-ton load and it's tested to 3000 pounds.

ONE TON CAPACITY

**THIS CHANCE HOIST HAS ALL THE FEATURES LINEMEN WANT**

- Well-balanced, easy-to-grip handle. . . operates from either side
- "Free-wheeling" for ease in hooking to load . . . automatic locking control prevents accidental dropping of load
- Half link and full link take-up for accuracy and speed
- Easy working swivel hooks on both chain and hoist housing
- Permanently lubricated oilite bearings
- All working parts fully enclosed in the housing to prevent injury to fingers.

A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

abc INDUSTRIES

C155-2


lished in January by the Western Electric Co.

Appearing quarterly, the magazine will contain comprehensive articles on many branches of engineering at Western Electric, the manufacturing and supply unit of the Bell Telephone System. It will go to Western Electric's 6,300 engineers, and also will be available to technical and scientific people outside the company.

The first issue contains 10 feature articles, including a number on recent technical developments. New processes are reported for cutting quartz crystals used in communications work, resulting in economies in material.

There is an article on a recently developed transistorized time-division multiplex—one-fifth the size and weight of former devices for transmitting a number of telegraph messages simultaneously over a single set of wires.

Another article describes special manufacturing methods required for extremely precise mass production of intricately twisted waveguides, used in radar and microwave radio.

Among the new magazine's departments is "The Engineer and Society," which contains short articles reflecting the increasing social responsibility of the engineer. To help him anticipate and shape the future, one article reports, educators are advocating more study by the engineer in the humanities and social sciences.

Engineers, physicists, chemists, mathematicians and other technical people will contribute articles to *The Western Electric Engineer*, according to an editor's foreword. Michael J. O'Leary, formerly editor of the *Bell Laboratories Reporter*, is editor of the new magazine. Request HL337.

•

ELECTRICAL ENGINEERING RESEARCH—Electrical engineering research facilities at Armour Research Foundation of Illinois Institute of Technology, Chicago, are described in newly published literature.

The information is presented in the form of five 4-page folders that explain the areas of research conducted in the following areas: computer systems; electric machines, components, and measurements; electronic instrumentation; communications and radio frequency applications, and control systems. Request HL338.

## Competition and Progress

"The competitive spirit has been the driving force of progress in America; the competitive principle is the very foundation of our national economy."—WILLIAM T. FARICY, *president, Association of American Railroads.*

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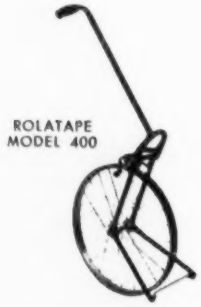

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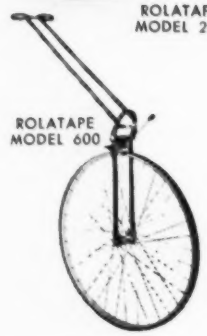
ROLATAPE MODEL 600



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## Federal Names Curtis To Engineering Post

George Louis Curtis has been named systems planning engineer in the Palo Alto research and development facility of Federal Telecommunication Laboratories, a division of International Telephone & Telegraph Co. Prior to

G. L. CURTIS

joining the Laboratories, Mr. Curtis was a member of the application-engineering division of Lynch Carrier Systems in San Francisco, and was responsible for customer applications and sales engineering in western U.S.A. and Canada for that company. From 1952 to 1954 he was associated with Lenkurt Electric Co. in design and engineering activities relating to telegraph- and radio-multiplexing equipment as well as open-wire, radio, and cable carrier.

In previous years Mr. Curtis has been associated with the Ontario Northland Railway as a communications engineer; with the Bell Telephone Co. of Canada in exchange, toll, transmission, and mobile-radio engineering; and with the Royal Canadian Air Force as a radio-radar officer and pilot.

A graduate of the University of Manitoba (B.Sc. E.E. 1940), he is a member of the Professional Engineers of Ontario.

## Directed Efforts

"If we are to keep our prosperity and continue evenly our dynamic growth without inflation and without 'boom or bust,' we must, as a nation, follow policies directed toward two objectives: (1) to restrain or postpone some of the less essential uses of money; (2) to encourage saving. These policies are the joint responsibility of the government of business, and banking."—W. RANDOLPH BURGESS, *Under Secretary of the Treasury.*

# A Process of Elimination

By eliminating carbons, organic materials and sustained arcing, a new standard in low maintenance attention has been established in the manufacture of telephone lightning arresters.

The new Cook Electric Company Mytigap accomplishes the function of a self-restoring high potential and power surge arrester by the use of nickel manganese alloy discharges, Cecotite ceramic insulation, and a self-compensated system of thermal ground switching. The elements which actuate the grounding electrodes are not sensitive to normal ambient temperatures of less than 300°F and —65°F.

The intense heat of arcing, however, produces movement. An arc of 30 amperes will cause grounding in one tenth of a second. The welding of the electrodes is prevented by high melting point of the Manganese Nickel alloy elements with RU78 added. The thermal flexure of the contact assembly assures the opening of the circuit after cooling below 300°F and self-restoration of the arrester is complete. For literature, samples, and additional information contact your nearest distributor or telephone supply salesman.

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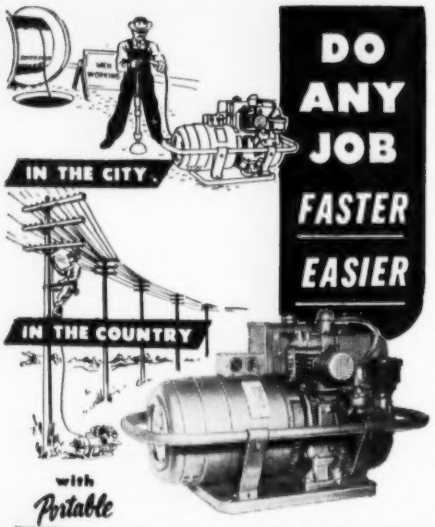


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## Gladwin Plastics, Inc. Names Blomeyer Vice President

After 18 years with the Gary Group in Nebraska, Missouri, Illinois, Indiana, Ohio, Kentucky, Tennessee, and Georgia, Earle B. Blomeyer has been elected vice president and a director of Gladwin Plastics, Inc. of Atlanta, it was announced by Ralph F. Chambers, executive vice president of the Atlanta firm which manufactures telephone merchandising aids.

E. B. BLOMEYER

Mr. Blomeyer's election is part of Gladwin's over-all expansion plan which included moving last month to 165 Courtland treet, N.E. thus making it possible to triple the production facilities of the firm.

Mr. Blomeyer, who will handle the development and sales of telephone industry products, began his career with the Gary Group after his graduation from Northwestern University in 1936. He served in various capacities with operating subsidiaries in Missouri, Illinois, Indiana, and Georgia prior to World War II. After service with the U. S. Army Signal Corps in World War II, he served as vice president and Kentucky general manager of the Southern Continental Telephone Co. and president of the Nebraska Continental Telephone Co. before joining the general offices of the Gary Group in Chicago in 1955. After the merger of the Gary Group and the General Telephone Corp., Mr. Blomeyer resigned in order to move to Atlanta.

Gladwin began developing and producing coin telephone sales aids in 1947. The company states that among its most important products used internationally is the "Glo-Dome," a lighted plastic top for outdoor telephone booths. Of recent development is the lighted bell for mounting on top of an aluminum booth. This is becoming the symbol for telephone service in many areas, the company reports.

The new carrying case for miniature color telephones is, according to the firm's executive vice president, already in use from coast to coast by both Independents and the associated Bell companies in promoting the color story. Also, Mr. Chambers said a great deal of development work on new telephone merchandising aids has been made possible by the expanded plant facilities and is now in progress.

## AT&T's Long Lines Awards Over-the-Horizon Contract

The Long Lines department of American Telephone & Telegraph Co. announces that a contract has been awarded for the construction of tower foundations and a building near Florida City, Fla. Work on the project began Feb. 4.

The building and towers will be part of a new "over-the-horizon" radio relay route planned by Long Lines. It will be used to transmit telephone messages between the United States and Cuba. This new service will supplement that now furnished on six submarine cables between Key West and Havana.

In preparation for the route, the one-acre site has been filled with rock to an elevation of 6 feet above the surrounding terrain. Crews plan to drill 132 holes 35 feet deep for foundations to support one concrete block building, three towers—one 200 feet high, and the two others, 30 feet—and two 60-foot square reflector antennas. The foundations and buildings are expected to be finished by April.

### The Uncommon Man

**Among the delusions offered by fuzz-minded people, wrote Herbert Hoover, is that imaginary creature the common man. It is dinned into us that this is the century of the common man.**

**The humor of it is that when we get sick, we want an uncommon doctor. When we go to war, we yearn for an uncommon general or admiral. When we choose a president of a university, we want an uncommon educator.**

**The imperative need of this nation at all times is the leadership of the uncommen men or women. We need men and women who cannot be intimidated, who are not concerned with applause meters, nor those who sell tomorrow for cheers today.**

## Stromberg Expands Employe Education Program

A liberalized tuition-aid education program for employes of Stromberg-Carlson, a division of General Dynamics Corp., was announced on Feb. 4 by President Robert C. Tait.

Under the revised program, the company will pay all tuition costs for regular full-time employes who are taking evening or extension courses directed toward advanced degrees, and half the tuition costs for those studying on the undergraduate level, up to a maximum of $250 per calendar year.

Mr. Tait explained that previously the company had paid only half the tuition costs of any course of study undertaken by an employe, and the maximum had been $75 a year.

The liberalized program was instituted, Mr. Tait explained, because Stromberg-Carlson is anxious to share the cost of individual improvement. Now, more than ever before, there is a need for men with advanced training, not only in the technical fields but in other fields as well, he said.

More than 425 employes, or about 6 per cent of the company's 7,100 employes, are enrolled in study courses at the Rochester Institute of Technology, the University of Rochester, Rochester Business Institute, other vicinity institutions, and some in correspondence schools.

All courses which are part of a planned degree program qualify for tuition aid, as do courses which are determined by an applicant's supervisor to be helpful in his job, Mr. Tait said.

He pointed out that interest in additional education has grown considerably in the past few years. Because the value of education is a double one, beneficial to both the individual and the company, Mr. Tait said, the company conducts an extensive in-plant program in which regular instructors conduct specific courses at no cost to the employes.

Among these are courses on components identification, blueprint reading, graphic presentation of data, and inspection procedures.

Employes also attend classes in a six-week course in Stromberg-Carlson's "XY" School, which is conducted for those who are concerned with the installation or maintenance of the company's "XY" telephone switching system.

## Gould-National Opens New Center in La Puente, Cal.

Gould-National Batteries, Inc., has opened a new service and repair center in La Puente, Cal.

With 3,000 square feet of storage space, the facility will stock new batteries and carry a complete line of repair parts, tools and instruments to quickly repair batteries damaged in service. It will expedite the rebuilding, repair, and delivery of commercial batteries used in material handling trucks, industrial tractors, telephone circuits, electric light and power, and railway signal and control circuits in the growing Los Angeles industrial area.

In addition to a full-time service station operator, the new center offers a complete field engineering counseling service and a staff of trained sales personnel to assist battery users in all phases of application, charging and maintenance. Richard J. Schubert is industrial district manager of the new center located at 14,500 Nelson Ave., La Puente.

## Tayor-Colquitt Elects

Taylor-Colquitt Co. has announced the election of A. B. Taylor as chairman of the board and A. B. Taylor Jr.


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XUM

as president, at the company's recent annual meeting.

## Localized Strength

". . . it is beyond argument that you cannot have a strong policy—national or international—if you have a weak nation. And it is beyond argument that a strong nation cannot be fabricated from a group of communities where the citizen is indifferent, where law and order can be flouted; that you cannot make a strong whole out of weak parts. More than 50 years ago Lord Bryce, the British student of the American political scene, found that the greatest failure in the American political structure was in local government. That still is true and it will remain so unless a vigilant press and a vigilant citizenry force changes."—WILLIAM H. GRIMES, *columnist.*


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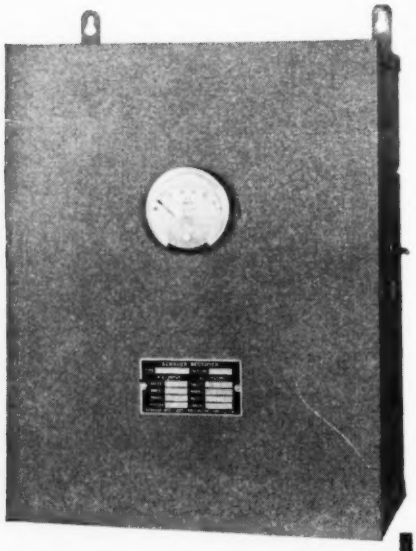

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*Automatic Electric Type #40 Monophone, Desk Handset Telephone, Self-Contained,
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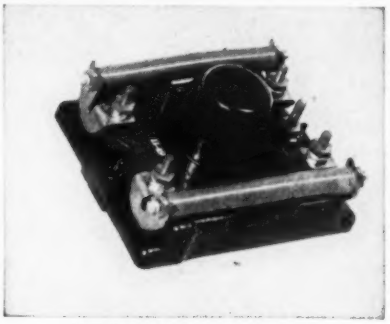

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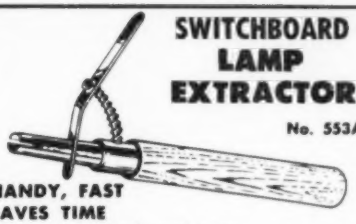

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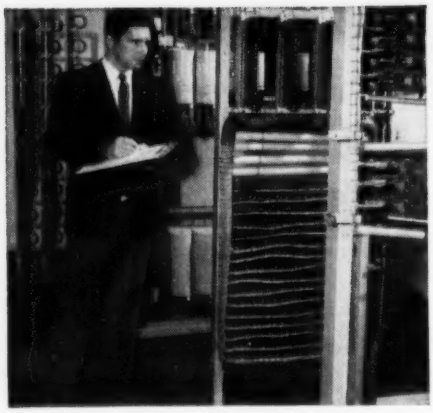

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